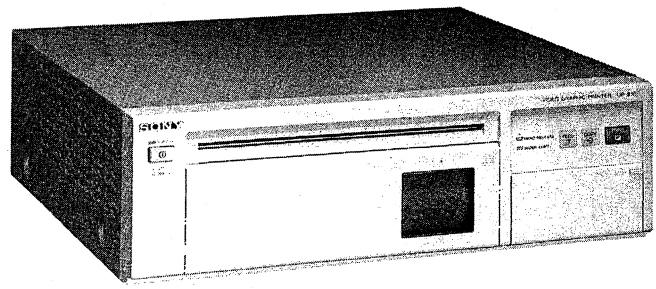
UP-910

SERVICE MANUAL

AEP Model
UK Model
Germany Model



SPECIFICATIONS

Thermal head	Thin-film thermal head (with built-in drive IC)
	768-dot drive
Gradations	128 (black and white)
Print size (at aspect ratio 4:3)	CCIR
	NORM: 182 x 140 mm (7 1/4 x 5 5/8 inches) (w/h)
	WIDE 1: 192 x 146 mm (7 5/8 x 5 3/4 inches) (w/h)
	WIDE 2: 200 x 150 mm (7 7/8 x 6 inches) (w/h)
Effective pixels	CCIR
	NORM: 700 lines x 560 dots (w/h)
	WIDE 1: 736 lines x 582 dots(w/h)
	WIDE 2: 768 lines x 608 dots (w/h)
Printing speed	Approx. 20 seconds/screen (at aspect ratio 4:3)
Input/Output terminals	VIDEO IN (BNC)
	CCIR
	Composite video signals
	1.0 V p-p
	75 ohms/high-impedance
	VIDEO OUT (BNC)
	Loop-through
	REMOTE (stereo minijack)*
	Connect optional foot switch FS-20
Power requirements	For the European model
	200 - 240 V AC, 50/60 Hz
Power consumption	For the European model
	Max. 1.3 A
Dimensions	Approx. 424 x 130 x 380 mm (w/h/d)
	(16 3/4 x 5 1/8 x 15 inches)
	Not including projecting parts and controls
Weight	Approx. 9.1 kg (20 lb. 1 oz.)
	Main unit only

Accessories supplied	AC power cord (1)
	Paper roll (UPP-216HD) (1)
	Paper shaft (1)
	Head cleaning sheet (1)
	BNC-BNC connecting cable (1)

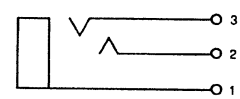
Recommended periodic check items on safety based on IEC 601-1

Earth leakage current	Less than 0.5 mA at normal condition
	Less than 1.0 mA at single fault condition
Protective impedance	Less than 0.1 ohm at 25 A
Checking interval	At least once a year

Maximum allowable voltages for INPUT/OUTPUT terminals are as follows:

VIDEO IN/OUT	1.0 V p-p
REMOTE	+5 V peak

* Technical specifications



1. GND
2. PRINT SIGNAL (TTL)
   Input of LOW pulse over 100 msec. initiate print.
3. PRINT BUSY (TTL)
   Goes HIGH during printing.

Design and specifications subject to change without notice.

Note
This appliance conforms with EEC Directive 87/308/EEC regarding interference suppression.

CAUTION
A CERTIFIED PLUG RATED 250V, 6A OR MORE FOR CLASS I EQUIPMENT MUST BE ATTACHED TO THE END OF THE POWER CORD.

VIDEO GRAPHIC PRINTER

SONY

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SAFETY-RELATED COMPONENT WARNING !!

COMPONENTS IDENTIFIED BY SHADING AND MARK ⚠ ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

SECTION 1
GENERAL

Overview

The UP-910 is a black-and-white video graphic printer that prints pictures from video equipment. Large size pictures can be printed out quickly and easily with the following features:

Clear and stable print quality

- High definition printing of 3.8 dots/mm
- 128 graduations of black and white
- Stable print-out by the temperature compensation technology
- High density print-outs by using the UPP-216HD printing paper.

Various output modes

- Print-outs can be made with bottom end first or upper part of the screen first by using the DIRECTION DIP switch.
- Aspect ratio of print-outs can be set to 4:3 or 1:1 by using the ASPECT DIP switch.
- Range to be printed out can be changed by using the SCAN MODE DIP switch.

Fast printing

A single print-out can be made within approximately 20 seconds.

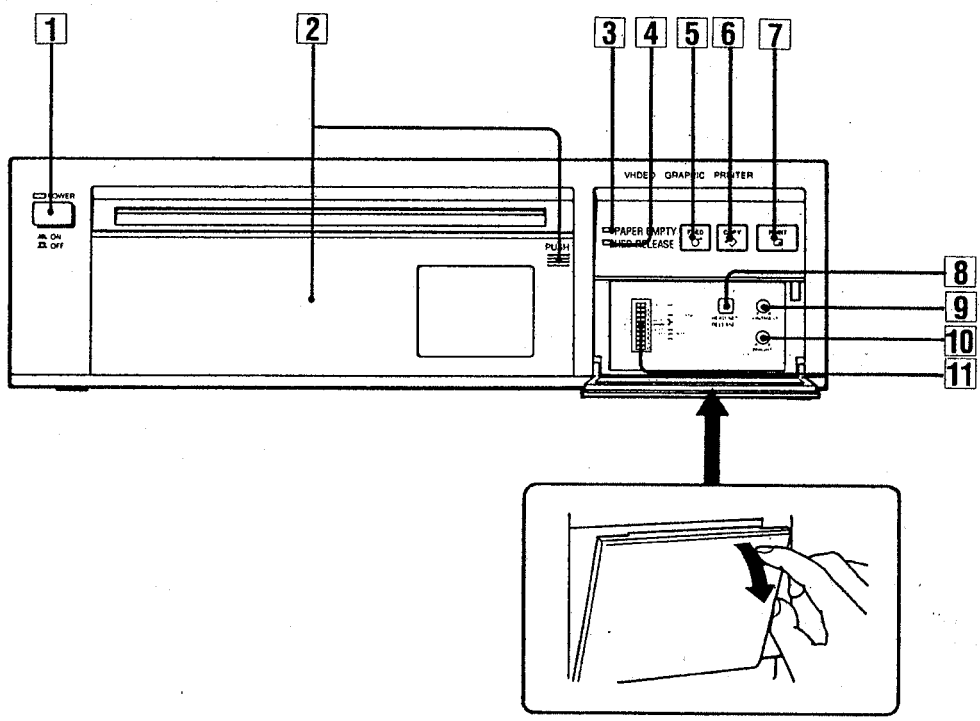
Automatic video signal discriminator

The type of input video signal (EIA or CCIR) is automatically discriminated and printed adequately; there is no need to change any switch manually.

Location and Function of Parts and Controls

Refer to the pages indicated in the circles for details.

Front Panel



1 **POWER ⏻ switch and indicator**
Press to turn on the power. The indicator lights up when the power is turned on.

2 **Paper lid**
Press the "PUSH" position to open.

3 **PAPER EMPTY indicator** ⓯
Lights up when the printer is out of paper.

4 **HEAD RELEASE indicator** ⓮ ⓱
Lights up when the thermal head is released (up).

5 **FEED ↻ button** ⓰ ⓱
Feeds paper, or stops printing.

6 **COPY ⇢ button** ⓰
Copies the previous print-out.

7 **PRINT ⎙ button** ⓯ ⓰
Prints the picture currently displayed on the monitor screen.

8 **HEAD SET/RELEASE button** ⓮ ⓱
Sets or releases the thermal head.
The HEAD RELEASE indicator lights up when the thermal head is released, or goes off when set.
The head is automatically set when the FEED ↻, COPY ⇢, or PRINT ⎙ button is pressed.

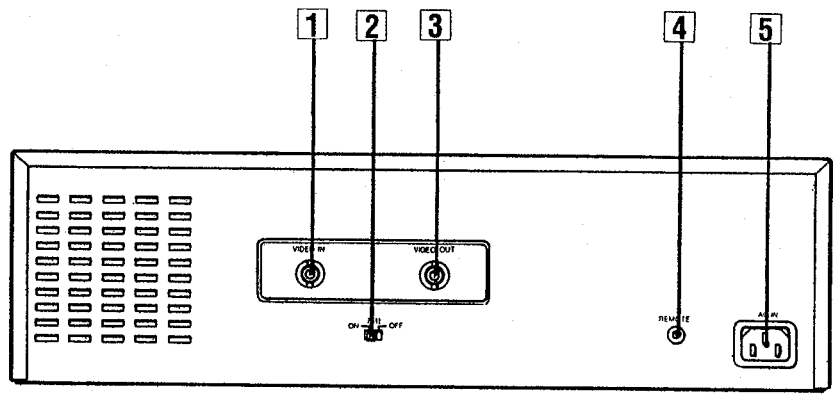
9 **CONTRAST control** ⓰
Adjusts the contrast of the print-outs.

10 **BRIGHT (brightness) control** ⓰
Adjusts the brightness of the print-outs.

11 **DIP switches**
Sets various print modes and functions. See page 9 for setting the switches.

Location and Function of Parts and Controls

Rear Panel



1 **VIDEO IN (video input) connector (BNC type)**
Inputs the composite video signal to be printed out.

2 **75Ω (impedance) ON/OFF switch**
Set this switch to ON when no equipment is connected to VIDEO OUT, or to OFF when the equipment, such as a monitor or a VCR, is connected to VIDEO OUT.

3 **VIDEO OUT (video output) connector (BNC type)**
Loop-through output of the VIDEO IN connector.

4 **REMOTE control jack (stereo minijack)**
Connect to the optional foot switch FS-20 for controlling print operation from a distance.

5 **~ AC IN (AC power input) connector**
Connect to a wall outlet, using the supplied AC power cord.

Precautions

On safety

Check the operating voltage before operation.
It must be identical to that of your local power supply (100 to 120V AC, 50/60 Hz in the U.S.A. and Canada; 200 to 240V AC, 50/60 Hz in Europe).

Stop operation immediately if any liquid or solid object falls into the cabinet.
Unplug the unit and have it checked by qualified personnel.

Unplug the unit from the wall outlet if you will not be using it for a long time.
Disconnect the cord by grasping the plug. Never pull the cord itself.

Do not disassemble the cabinet.
Refer servicing to qualified personnel only.

Do not touch the cutting blade of the printer.

Connect the power plug of the printer to the wall outlet having protective earth terminal.
The safety earth should be properly established.

Do not use the FS-20 foot switch (not supplied) in the operating room.

On operation

Do not turn the power off while the printer is printing.
Otherwise, the thermal head may be damaged.

On installation

Provide adequate air circulation to prevent heat build-up.
Do not place the unit on surfaces such as rugs, blankets, etc., or near materials such as curtains and draperies.

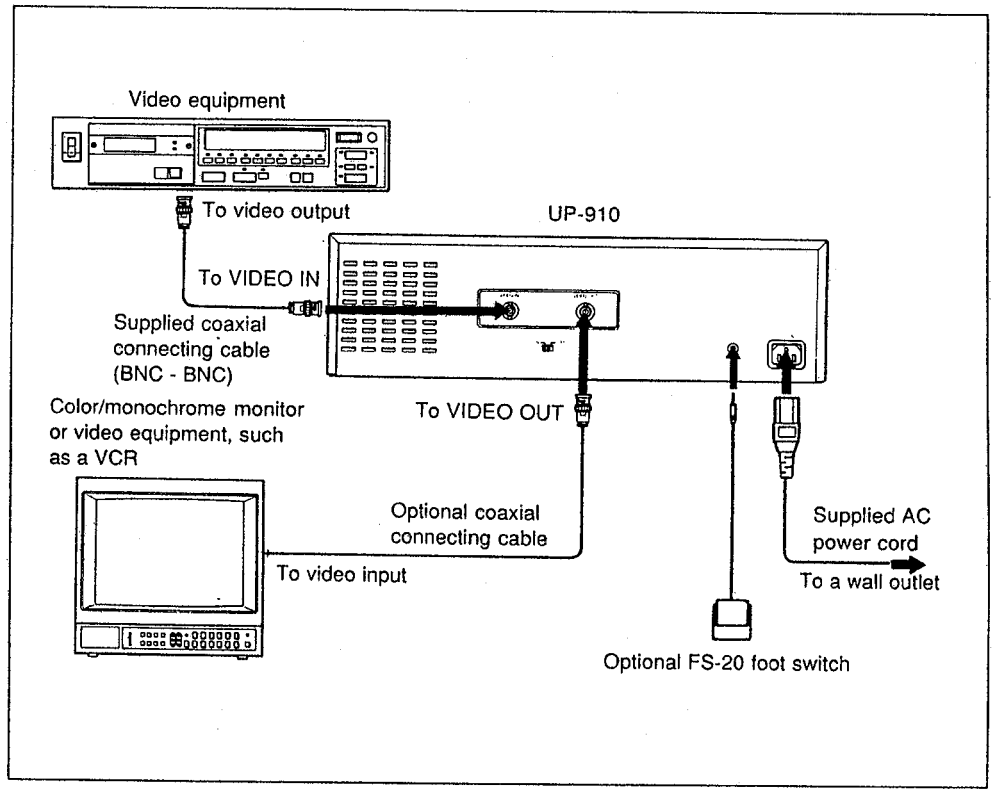
Place the printer on a level, stable surface during operation.
Do not install the printer near heat sources. Avoid locations near radiators or air ducts, or places subject to direct sunlight or excessive dust, humidity, mechanical shock or vibration.

Note:
It is our responsibility for the effects on safety, reliability and performance of the equipment only if:
—re-adjustments, modification or repairs are carried out by authorized personnel and
—the equipment is used in accordance with the instructions for use.

Connection

Notes on connection

- Turn off the power of each device before making connections.
- Connect the AC power cord last.

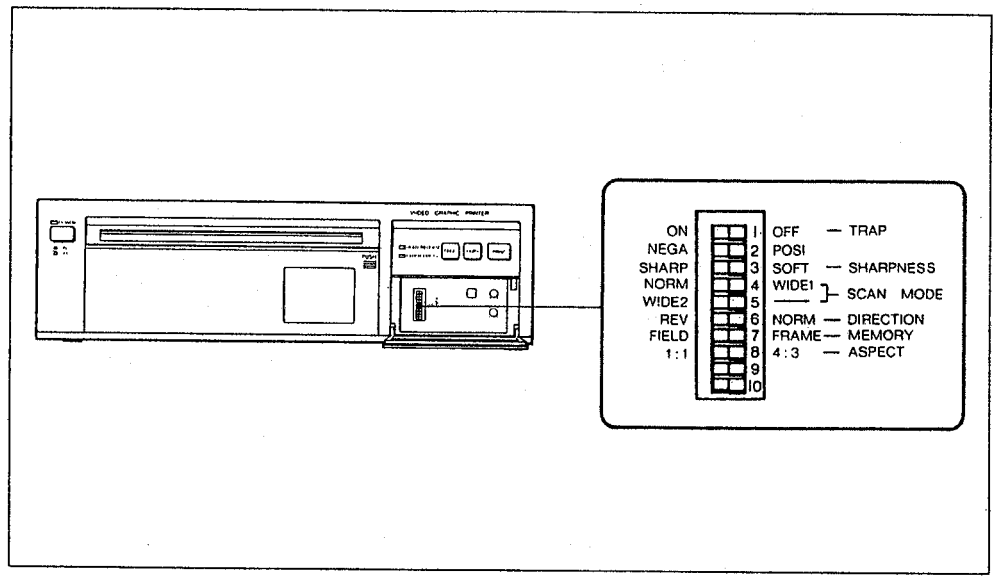


Do not use the FS-20 foot switch (not supplied) in the operating room.

Setting of the DIP Switches

Set the DIP switches according to the print mode required and the type of video equipment connected to the printer.
Before setting the DIP switches, turn the printer off. Then change the setting with a small pointed tool such as a ball point pen.

The default setting of the DIP switches is shown below.



1 TRAP (color) switch
Set this switch to ON when the input video signal to be printed out is in color and to OFF when it is in black and white.

2 NEGA/POSI (negative/positive print) switch
Set this switch to NEGA to make negative print-outs and to POSI to make positive print-outs.

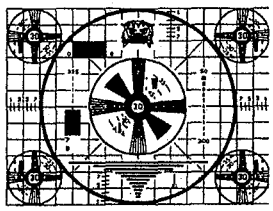
3 SHARPNESS switch
Set this switch to SHARP to obtain greater sharpness of the print-outs.

9

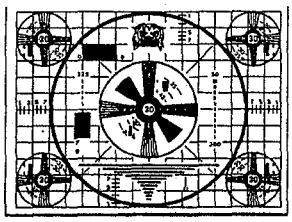
Setting of the DIP Switches

4 SCAN MODE switches

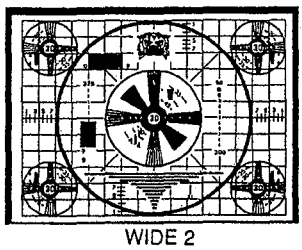
Extend the range to be printed out.
To print only the part of the screen displayed on the monitor, set to NORM. To extend the range, set the switch to WIDE 1 (be sure that the other switch is not set to WIDE 2).
To further extend the range, set the switch to WIDE 2. WIDE 2 will be selected, regardless of the position of the NORM-WIDE 1 switch.



NORM



WIDE 1



WIDE 2

5 DIRECTION switch

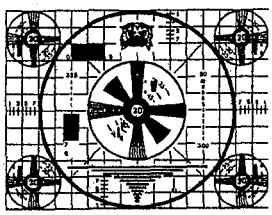
Selects which end of the screen is to be printed first.
Normally, keep this switch at NORM. The screen will be printed out bottom end first.
To print out the upper part of the screen first, set this switch to REV.

6 MEMORY switch

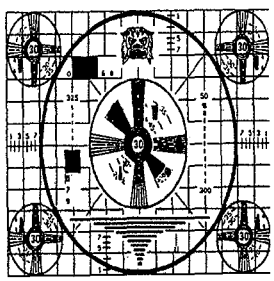
Normally, keep this switch at FRAME. When printing fast moving pictures (such as movement of a ball being thrown), the print-out may blur. In this case, set this switch to FIELD. The print-out will be slightly rough but less blurred.

7 ASPECT switch

Normally keep this switch at 4:3. When the aspect ratio of the video signal is 1:1, set this switch to 1:1.
The print-out will be longer than the print-out taken at 4:3.



4:3



1:1

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Loading Paper

On the Printing Paper

Type of printing paper

The use of printing paper other than Sony printing paper may result in diminished printer performance and poor print quality.
Use only the specified paper UPP-216SE or UPP-216HD.

Before making a print-out, be certain the paper type can be used in your printer.

Print quality	Type of paper
TYPE II (Normal)	UPP-216SE
TYPE II (High Density)	UPP-216HD

When storing the paper

Do not leave unused or printed paper in hot or humid places.
Do not leave for an extended period of time in a place subject to direct sunlight or bright room light.

Store unused or printed paper in a cool, dark place (below 30°C or 86°F).
We recommend that you store printed paper in a polypropylene pouch.

Do not allow any volatile organic solvent or vinyl chloride to contact the printed paper.
Alcohol, plastic tape or film will fade the print-out. To attach printed paper to another piece of paper, use double-sided plastic tape or water-based or solid glue.

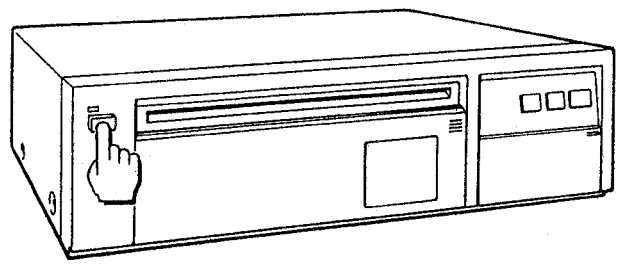
Do not stack printed paper on or under a freshly-developed diazo copy sheet.

Loading Paper

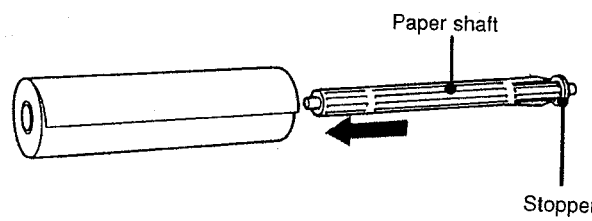
Before loading paper

- Do not fold the paper or rub or touch the printing surface.
  Dust on the printing surface will also result in poor print quality.
- When loading the paper roll, pull out and cut the first 20 to 25 cm (8 to 10 inches) of the paper.
  Otherwise the print quality will not be satisfactory and the printer may malfunction.

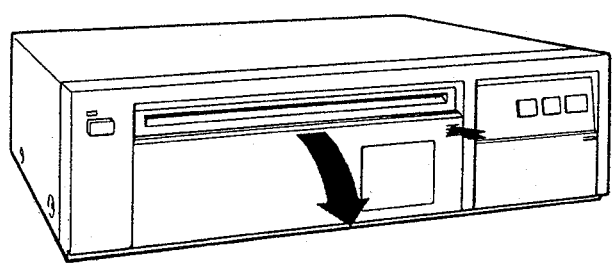
1 Turn the power on.



2 Put the supplied paper shaft through the paper roll.



3 Press "PUSH" to open the paper lid.



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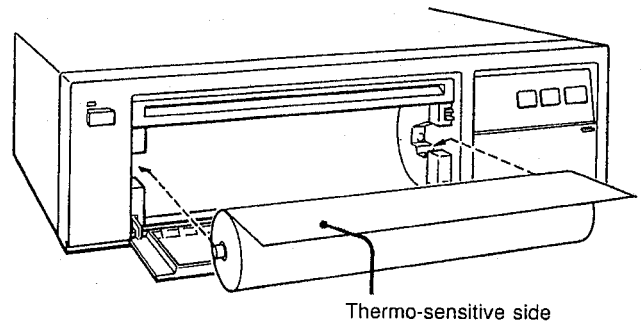
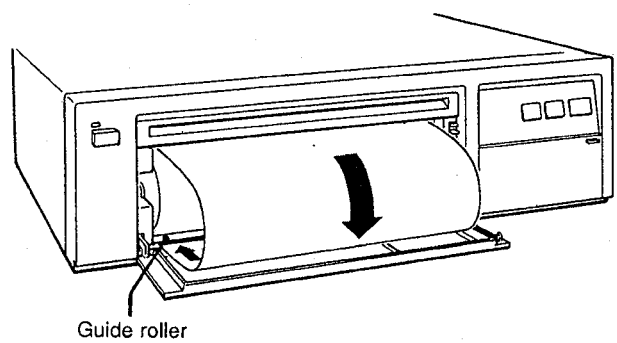
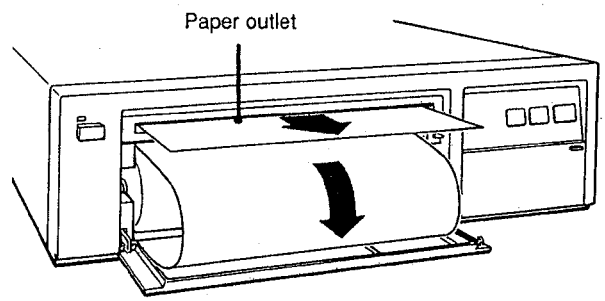
4 **Put the paper shaft into the printer.**
Place the paper with the thermo-sensitive side up.



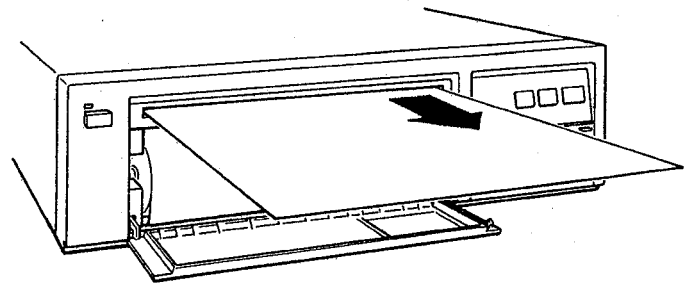
5 **Insert the paper end into the paper insertion slot.**
The paper insertion slot is under the guide roller.



6 **Feed the paper with your hands until its end comes out from the paper outlet.**

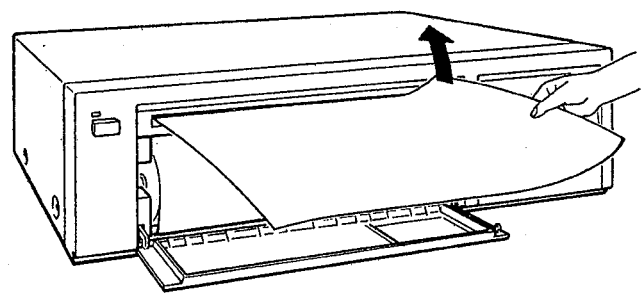


7 **Pull out the paper to remove any slack of the roll.**
Pull out 20 to 25 cm (8 to 10 inches) of the paper.



8 **Press the HEAD SET/RELEASE button to set the thermal head.**
The HEAD RELEASE indicator goes off.

9 **Tear the first end of the paper off with your hands.**



10 **Close the paper lid.**

Making Print-Outs

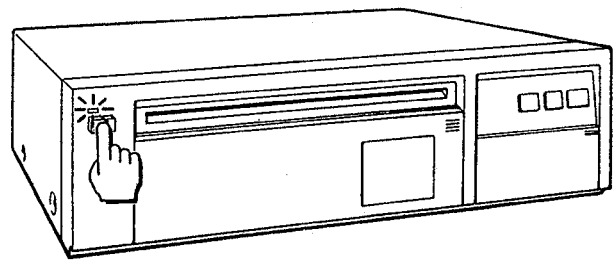
Before making print-outs

- Be sure that the setting of the DIP switches are correct (see page 9).
- Be sure that the connections are correct and that the print source is input to the VIDEO IN connector of the printer.
- Be sure that the paper roll is loaded properly and the PAPER EMPTY indicator is off (see page 12).

Printing a picture

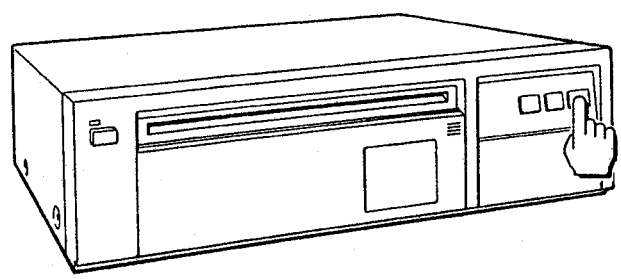
Follow the step below to print a picture.

1 **Turn the power on.**



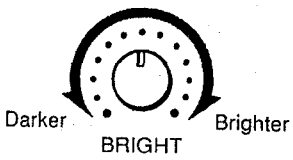
2 **Make sure that the PAPER EMPTY indicator is off.**

3 **Press the PRINT ❑ button when the monitor screen displays the picture you want to print.**

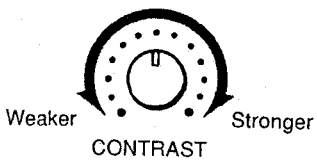


To adjust the contrast and brightness of the picture

Adjusting the brightness



Adjusting the contrast



To stop printing

Press the FEED button. Printing will stop and the paper will continue to feed while FEED is pressed.

To stop printing and print another picture displayed on the screen

Press the PRINT button. Printing will stop and the picture displayed on the monitor screen will be printed out.

To print the previous print-out again

Press the COPY button. The last print-out will be copied. This last print-out is retained in the memory of the printer and can be copied with the COPY button as many times as you want, until the PRINT button is pressed again or power is turned off and the memory is erased.
The COPY button will not function while a print-out is being made.

When you are not using the unit for an extended period of time

If you are not using the unit for more than 2 weeks, release the thermal head by pressing the HEAD SET/RELEASE button and remove the paper roll out of the unit.

Maintenance

Cleaning the Cabinet

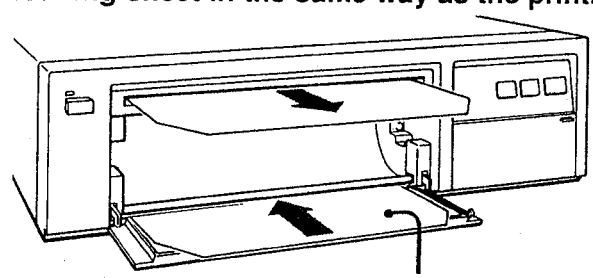
Do not use strong solvents for cleaning the printer.
Thinner or abrasive cleansers will damage the cabinet.

Cleaning the Thermal Head

Use the supplied cleaning sheet to clean the thermal head when the print-out is dirty.

How to use the supplied cleaning sheet

1. **Turn the power on and open the paper lid.**
2. **Make sure that the HEAD RELEASE indicator is lit.**
   Otherwise, press the HEAD SET/RELEASE button.
3. **Remove the printing paper.**
4. **Insert the cleaning sheet in the same way as the printing paper.**



Supplied cleaning sheet

5. **Press the FEED ↻ button until the cleaning sheet is fed out completely.**
6. **Load the printing paper.**
7. **Close the paper lid.**

Caution
Never press the PRINT ⎙ nor COPY ⇳ button while the cleaning sheet is inserted.

Checking for Earth Continuity

Earth continuity test of the AC power supply cord should be conducted periodically at least every six months as follows:

1. **Connect the AC power cord to the printer.**
2. **Check the continuity of the safety feature between earth terminal of the plug and chassis (rear panel) by utilizing ohm meter, a battery and buzzer combination or the like.**

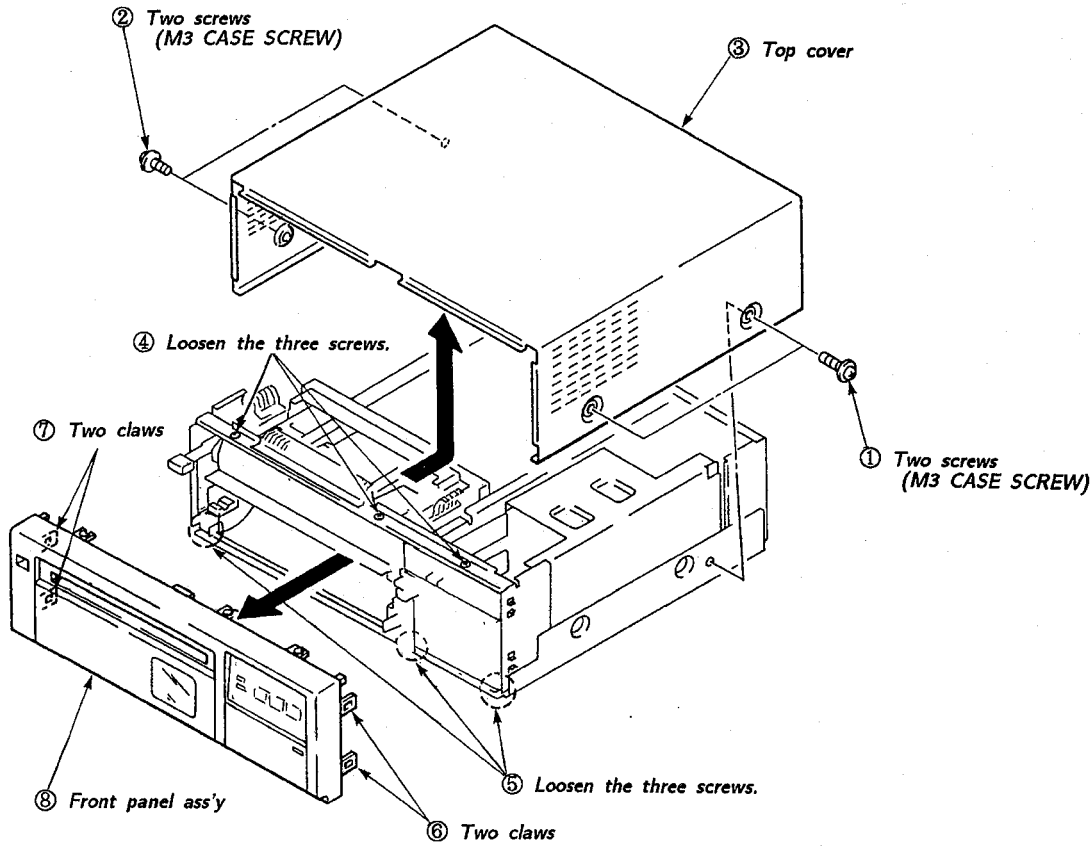
17

Troubleshooting

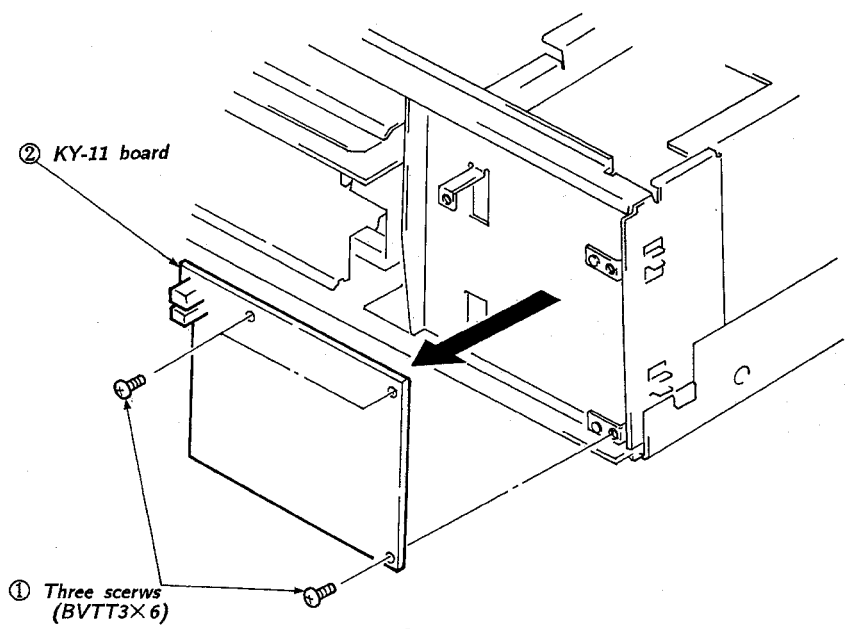
Symptom	Cause/remedy Refer also to the pages indicated in ●.
White specks on the first few print-outs.	Feed the paper until clean portion appears. When printing with a newly-inserted roll, fine dust on the surface of the paper may cause white specks on the print-outs.
Print-out is dirty.	Clean the thermal head with the supplied head cleaning sheet (page ⓱).
Black borders or missing portions around the print-out	Change the setting of the SCAN MODE switch of the DIP switches (page ❾).
Printing does not start when the PRINT button is pressed.	• Is the power turned on ? • Are the connections made correctly ? (page ❽) • Is the paper set properly ? • Is video signal input to the unit ?
No image on the paper	Load the paper with its thermo- sensitive side up. (page ⓬) If the paper is loaded with its thermo-sensitive side down, printing cannot be made.
Paper jam	Press the HEAD RELEASE button to release the thermal head, and then remove the jammed paper by slowly pulling it from the paper insertion slot. Paper jam is likely to occur when there is moisture condensation within the unit. (Moving the unit suddenly from a cold place to a warm place often results in moisture condensation.) In case of moisture condensation, remove the paper, turn off and leave the unit for about an hour or two..
Whitish print-out after a number of continuous black print-outs	Stop printing for a while. Print-out may suddenly become light when the printer continually prints 15 or more totally black pictures, which results from the protection program against heat built-up of the thermal head.
White portions printed dark after a number of continuous black print-outs	Stop printing for a while. Dark print-outs often result from heat build-up of the thermal head.
White lines and small letters on the screen are obscure.	Is the TRAP switch of the DIP switches set to ON when the input signal is in black and white ? (page ❾)
Small squares appear on the whole screen.	Is the TRAP switch of the DIP switches set to OFF when the input signal is in color ?
The screen is too dark or too light to adjust.	Is the 75 ON/OFF switch set correctly ? (page ❻)
The print-out seems vertically long.	Is the ASPECT switch of the DIP switches set to 1:1 ?

SECTION 2
DISASSEMBLY

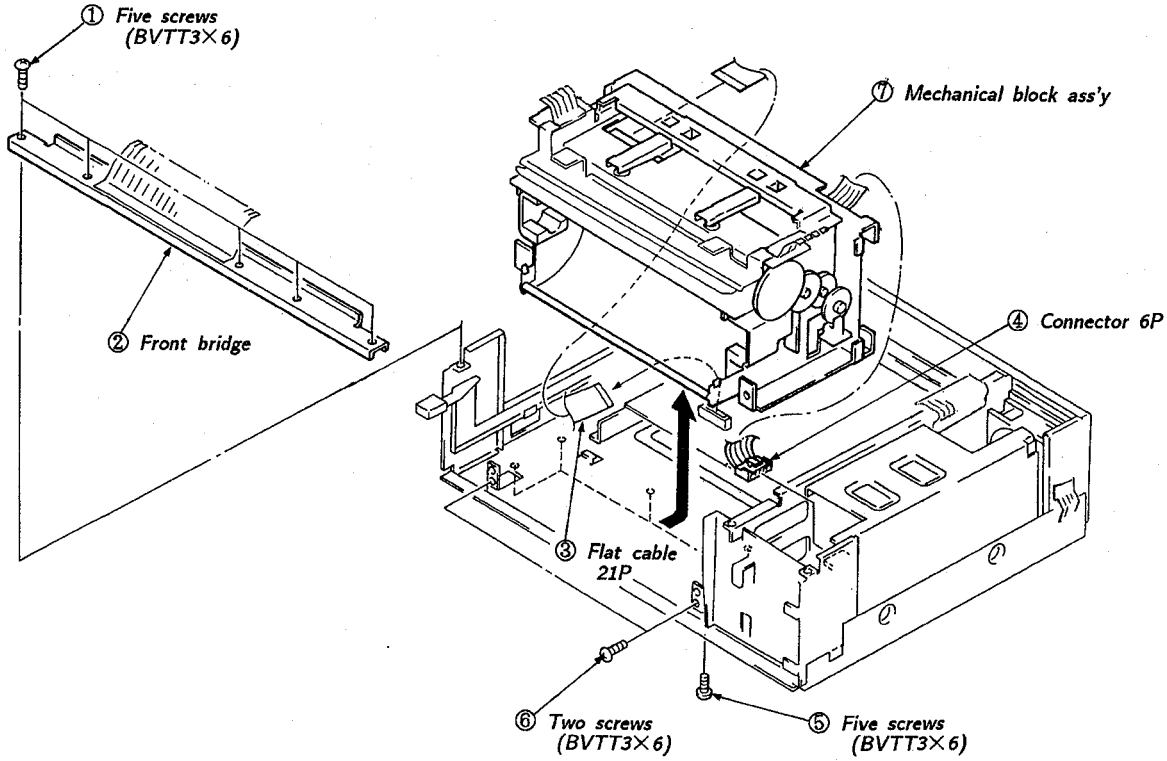
2-1. FRONT PANEL ASSEMBLY REMOVAL



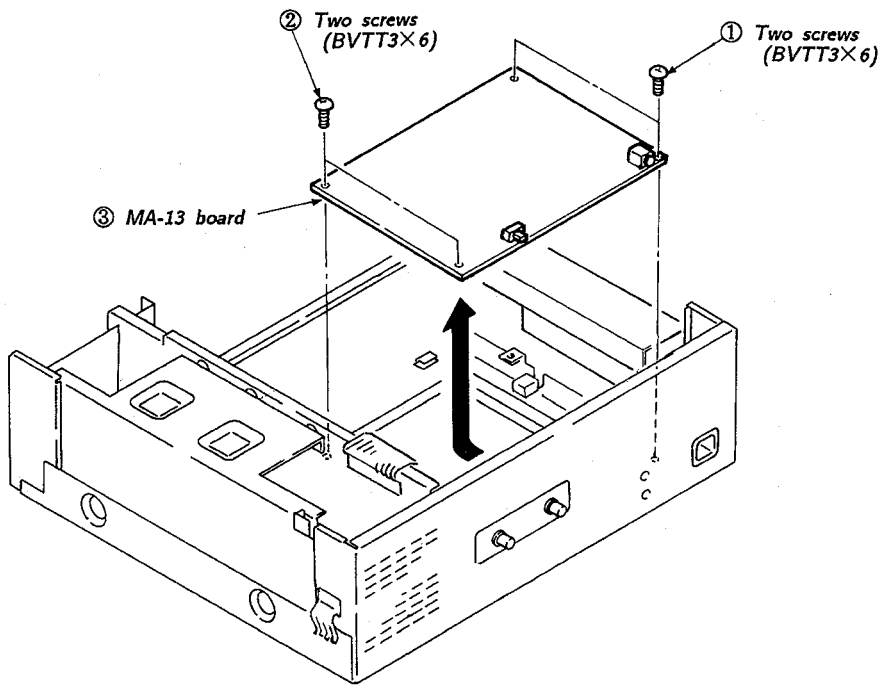
2-2. KY-11 BOARD REMOVAL



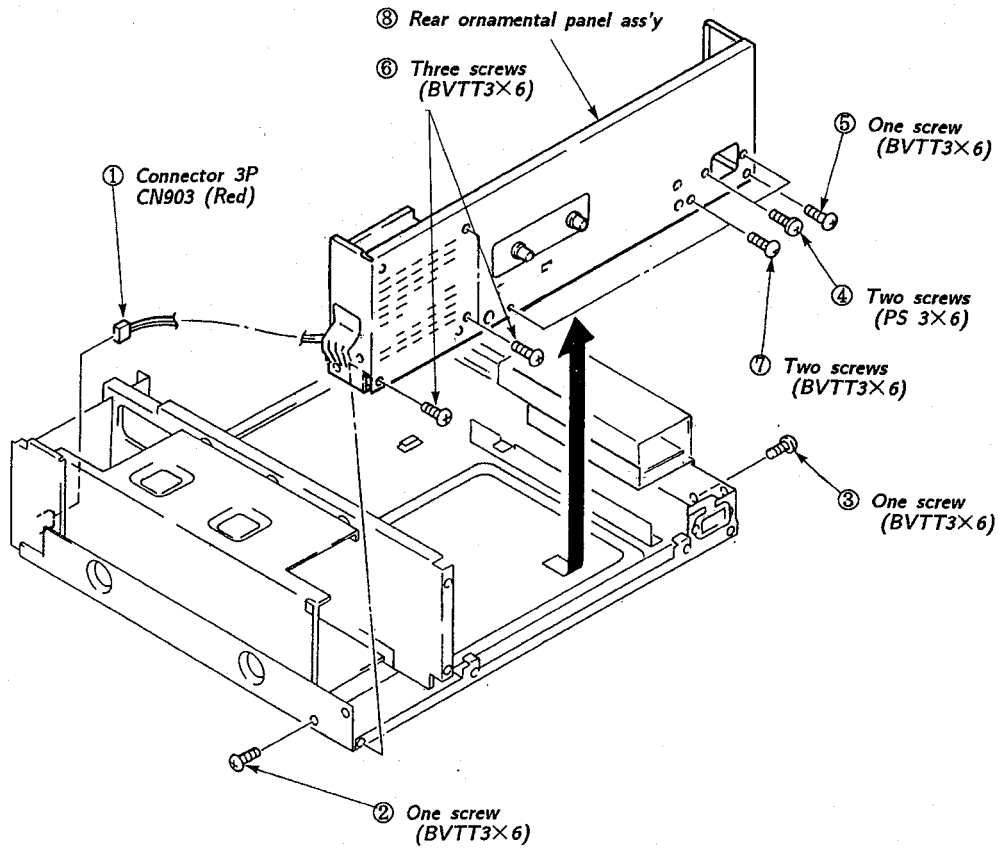
2-3. MECHANICAL BLOCK ASSEMBLY REMOVAL



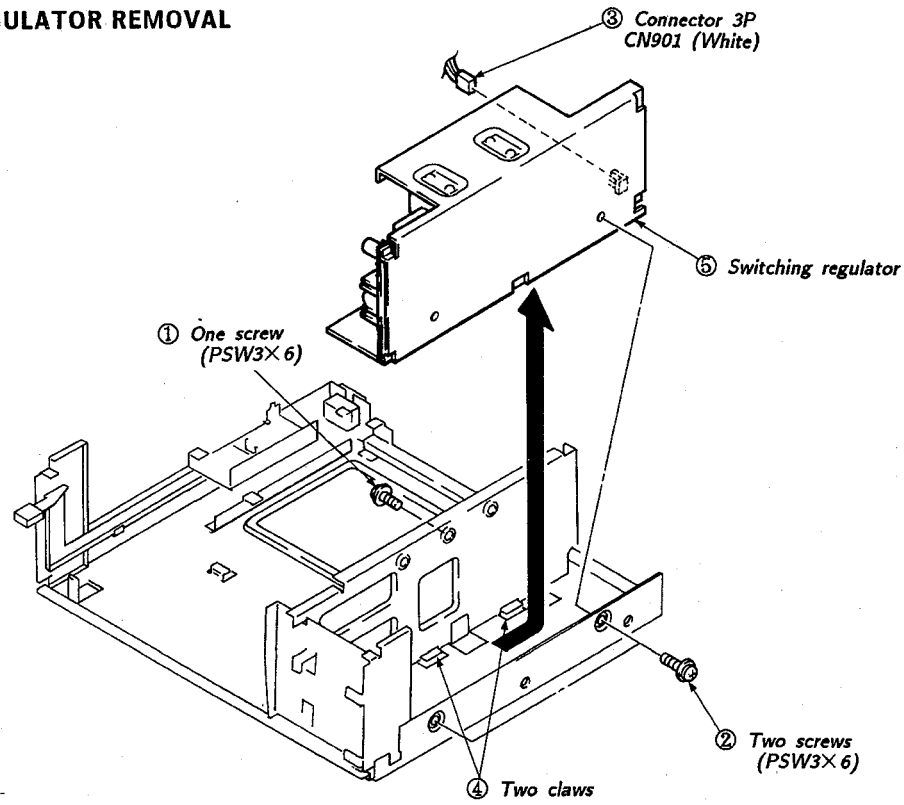
2-4. MA-13 BOARD REMOVAL



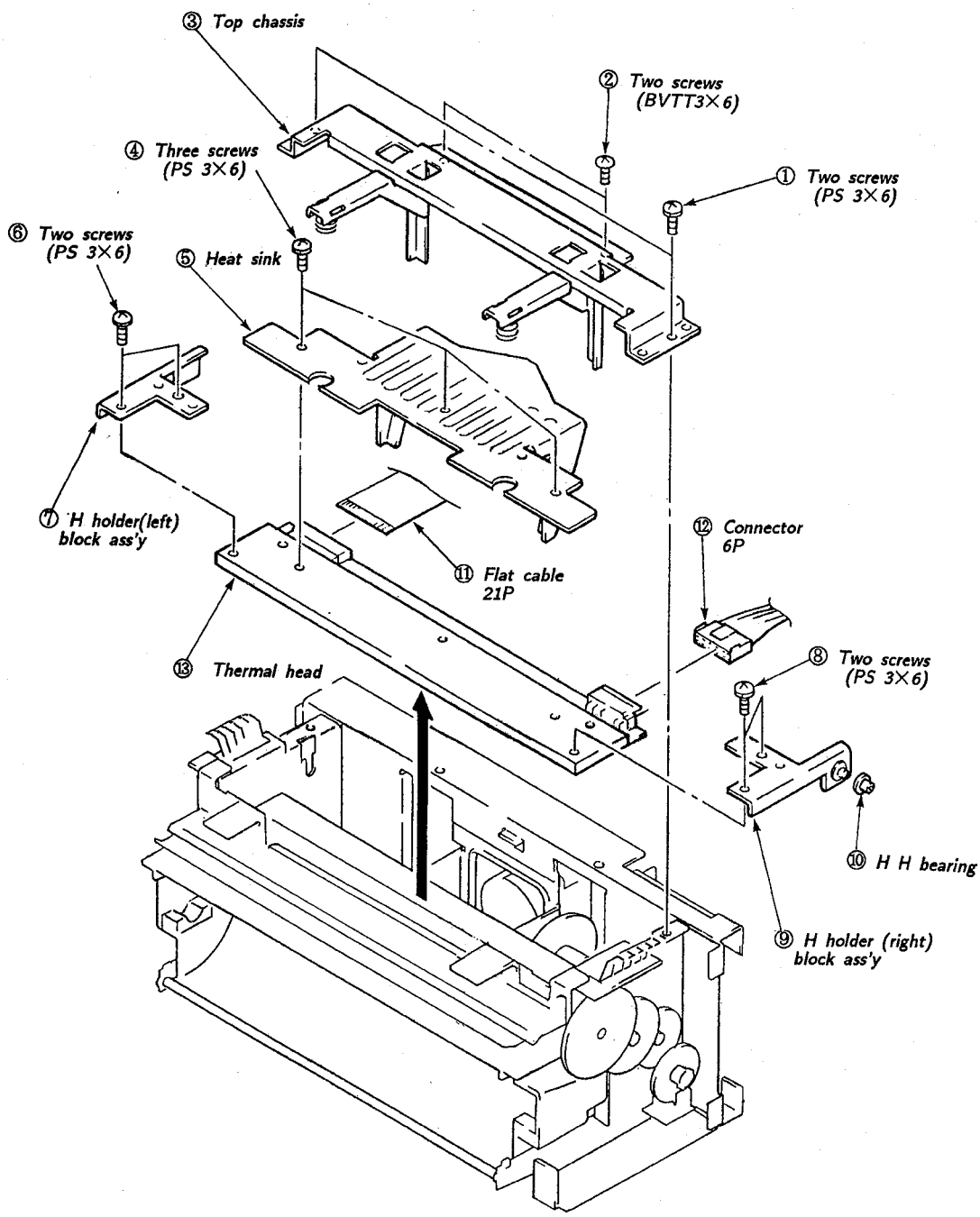
2-5. REAR ORNAMENTAL PANEL ASSEMBLY REMOVAL


⑧ Rear ornamental panel ass'y
⑥ Three screws (BVTT3×6)
⑤ One screw (BVTT3×6)
① Connector 3P CN903 (Red)
④ Two screws (PS 3×6)
⑦ Two screws (BVTT3×6)
③ One screw (BVTT3×6)
② One screw (BVTT3×6)

2-6. SWITCHING REGULATOR REMOVAL



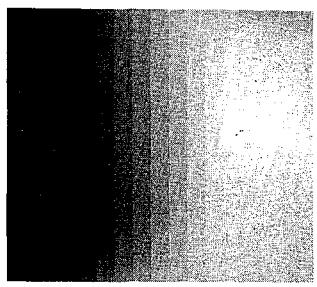
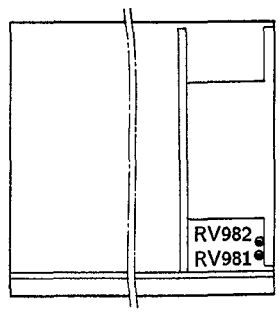
2-7. THERMAL HEAD REMOVAL


③ Top chassis
② Two screws (BVTT3×6)
④ Three screws (PS 3×6)
① Two screws (PS 3×6)
⑥ Two screws (PS 3×6)
⑤ Heat sink
⑦ H holder(left) block ass'y
⑫ Connector 6P
⑪ Flat cable 21P
⑧ Two screws (PS 3×6)
⑬ Thermal head
⑩ H H bearing
⑨ H holder (right) block ass'y

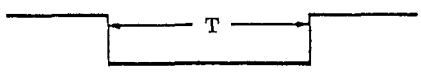
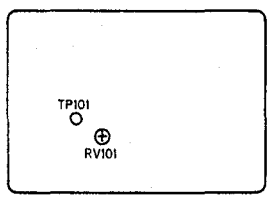
SECTION 3
ADJUSTMENTS

Required Equipments
1. Oscilloscope
2. Frequency counter
3. Color-bar pattern generator (1411. signal generator)
4. Signal generator (J-900-010-A)
5. Digital multimeter

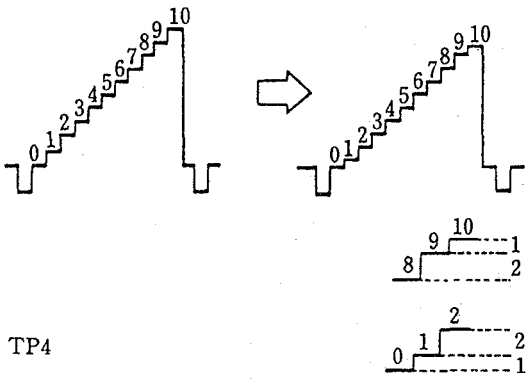
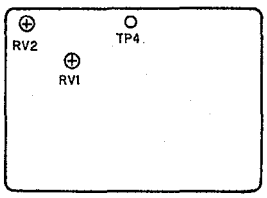
3-1. HEAD VOLTAGE ADJUSTMENT

machine conditions for adjustment	specification	adjustment
• VIDEO IN JACK: Color-bar • Set the POWER switch while pressing the buttons of PRINT, COPY and FEED at the same time. (about 3 seconds) • For printing out, press PRINT button.	 Fig.1 Adjust RV981 and RV982 to make 17-steps gradation signal smooth as shown in Fig.1.	⊘ RV981 (Course) ⊘ RV982 (Fine)  FRONT SIDE

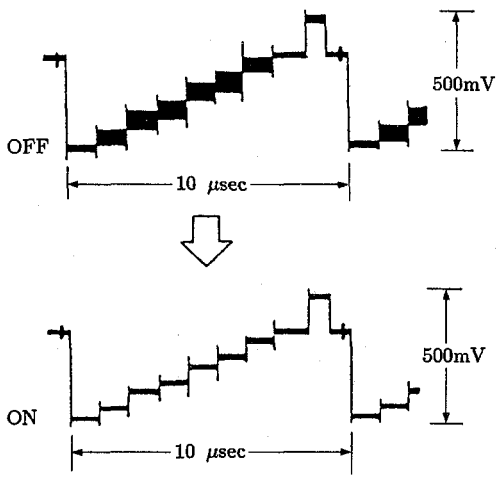
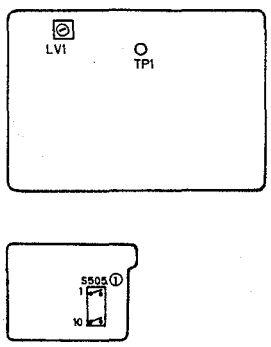
3-2. V. DELAY ADJUSTMENT

machine conditions for adjustment	specification	adjustment
• VIDEO IN JACK: Color-bar • Set the knobs of CONTR and BRT to the center position.	TP101/D-3 (MA-13)  T=382 ± 5 μsec	⊘ RV101/E-4 (MA-13) 

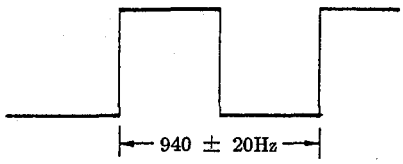
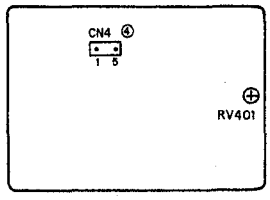
3-3. VIDEO AMP ADJUSTMENT

machine conditions for adjustment	specification	adjustment
• VIDEO IN JACK: 10-step signal (1410 Signal generator). • Set the knobs of CONTR and BRT to the center position.	TP4/A-5 (MA-13)  TP4	● RV1/B-3 (MA-13) ● RV2/A-1 (MA-13) 

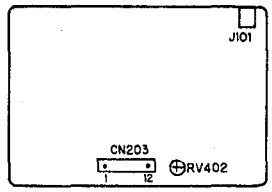
3-4. TRAP ADJUSTMENT

machine conditions for adjustment	specification	adjustment
• VIDEO IN JACK: Color-bar • Set the trap of DIP switch (DIP SW S505 No.1) to ON.	TP1/B-5 (MA-13)  TP1	● LV1/A-2 (MA-13) 

3-5. MOTOR SPEED ADJUSTMENT

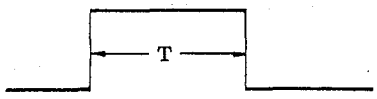
machine conditions for adjustment	specification	adjustment
● VIDEO IN JACK : Color-bar ● Pressing the button of PRINT and measure the waveform (frequency) on Pin 4 of CN4.	CN4/B-4 (MA-13) 	◐ RV401/D-9 (MA-13) 

3-6. TEMPERATURE-COMPENSATING CIRCUIT ADJUSTMENT

machine conditions for adjustment	specification	adjustment
● Load the paper roll and turn the power on. ● Press the button of FEED.	CN203-11/G-5 (MA-13) Adjust the temperature pulse to the reference values as shown in Table 1 by being left at the room temperature for a few hours, with POWER switch OFF.	◐ RV402/G-6 (MA-13) 

Room temperature (℃)	Temperature pulse (T) msec
10 ~ 12	15.64 ~ 15.33
12 ~ 14	15.33 ~ 15.01
14 ~ 16	15.01 ~ 14.68
16 ~ 18	14.68 ~ 14.34
18 ~ 20	14.34 ~ 14.00
20 ~ 22	14.00 ~ 13.65
22 ~ 24	13.65 ~ 13.12
24 ~ 26	13.12 ~ 12.94
26 ~ 28	12.94 ~ 12.58
28 ~ 30	12.58 ~ 12.22

Table 1



3-7. ADJUSTMENT AFTER THE POWER SUPPLY IS REPLACED

"3-1. HEAD VOLTAGE ADJUSTMENT" should be performed.

MEMO

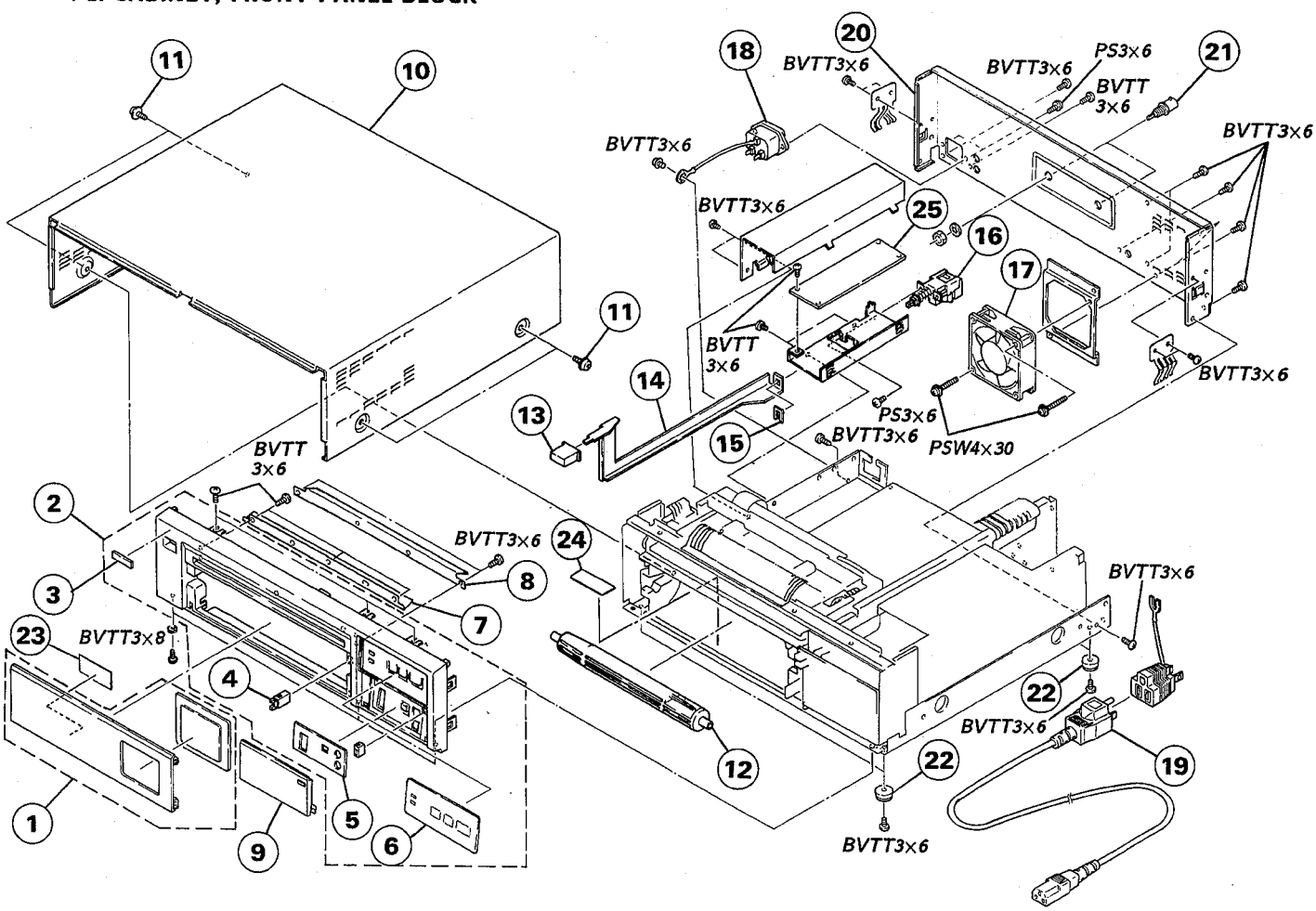
SECTION 4
EXPLODED VIEWS

NOTE:

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

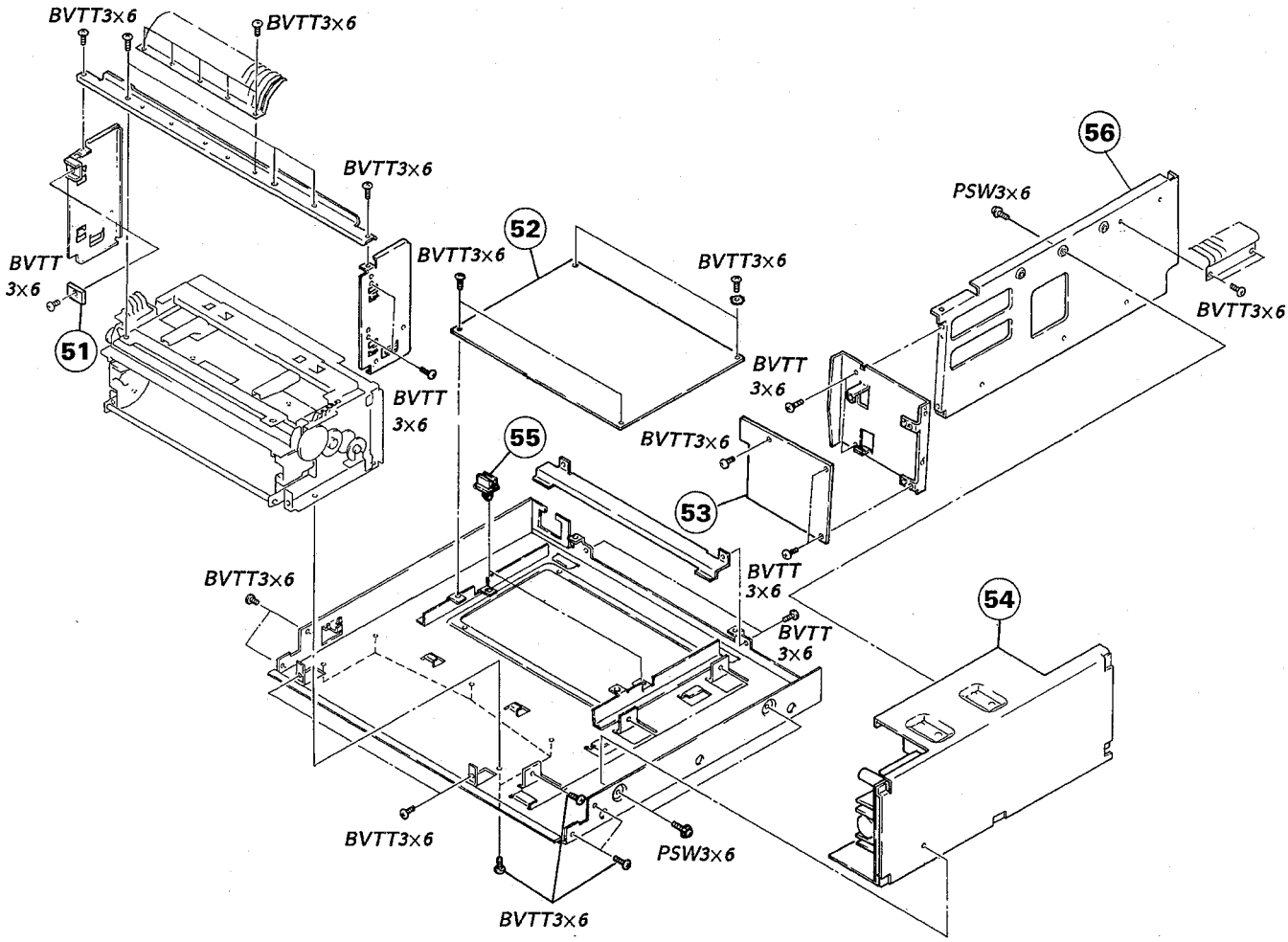
4-1. CABINET, FRONT PANEL BLOCK



Ref.No	Part No.	Description	Remark
1	X-3714-939-2	DOOR ASSY, FRONT	
2	X-3165-242-2	PANEL ASSY, FRONT	3-6
3	3-718-322-01	EMBLEM, SONY	
4	4-374-714-01	CATCH, PUSH	
5	3-745-374-01	PANEL(S), SHEET	
6	3-165-228-01	PANEL(M), SHEET	
7	*3-745-367-01	GUIDE, FRONT	
8	*3-741-017-01	GUIDE, PAPER	
9	X-3714-940-2	DOOR ASSY, KEY	
10	*3-741-049-01	COVER, TOP	
11	4-886-821-11	SCREW, M3 CASE	
12	3-741-020-01	SHAFT, PAPER	

Ref.No	Part No.	Description	Remark
13	2-431-568-31	BUTTON, POWER	
14	*3-741-044-01	ROD, POWER SWITCH	
15	3-725-616-01	STOPPER, ROD	
16	⚠ 1-554-880-11	SWITCH, PUSH(AC POWER)(1 KEY)	
17	1-541-593-11	MOTOR, DC FAN	
18	⚠ 1-560-222-11	INLET 3P	
19	⚠ 1-556-760-11	CORD, POWER	
20	*3-745-375-02	PANEL, REAR ORNAMENTAL	
21	1-562-261-21	RECEPTACLE, BNC	
22	X-4875-123-1	FOOT ASSY, MF	
23	*3-734-879-01	LABEL LOADING,PAPER(E)	
24	*3-734-882-01	LABEL CAUTION,PAPER(E)	
25	*1-633-873-11	FU-1 BOARD	

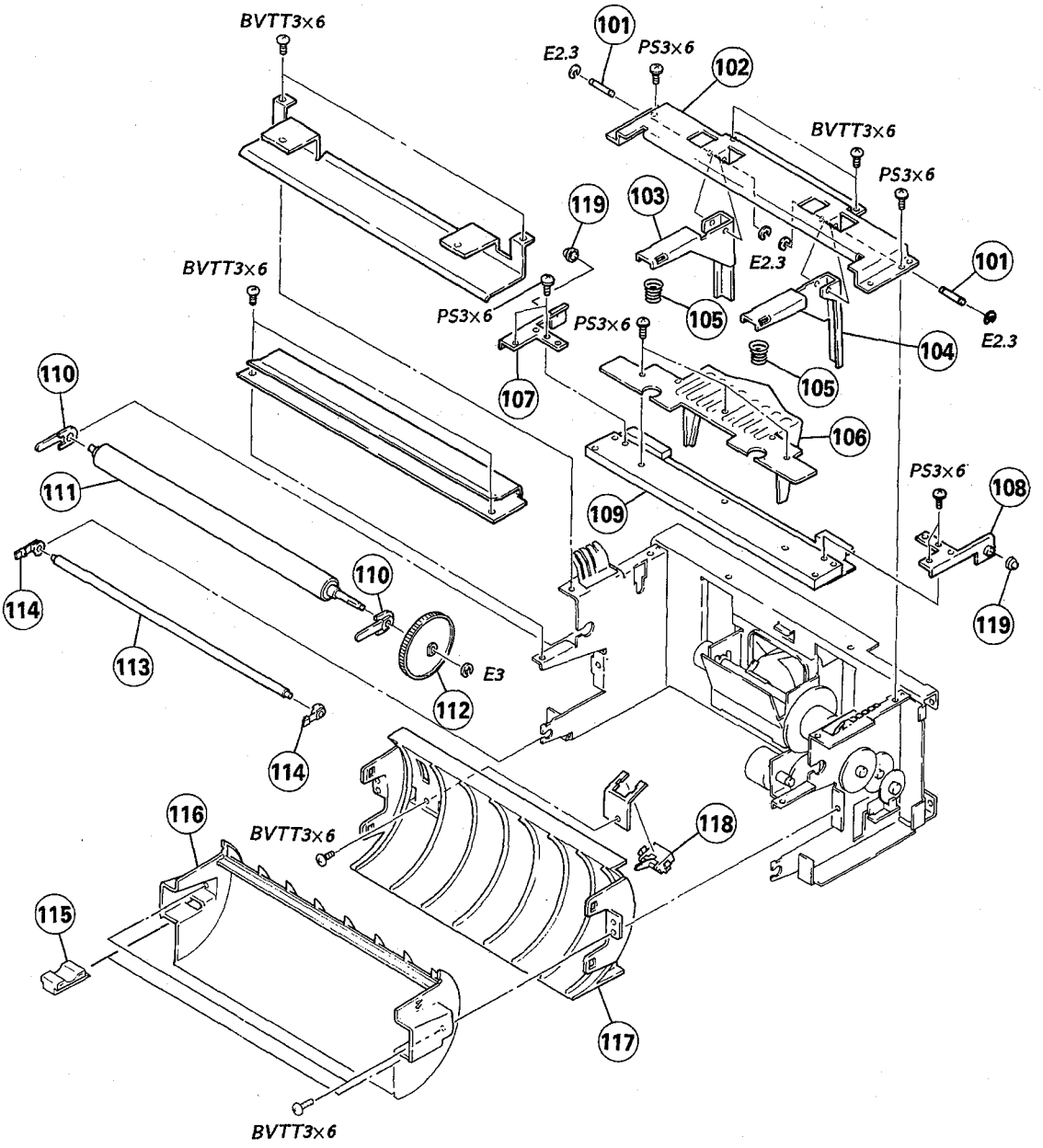
4-2. CHASSIS BLOCK



Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No	Part No.	Description	Remark
51	*1-635-722-11	LE-5 BOARD	
52	*A-8271-082-A	COMPLETE PCB, MA-13	
53	*A-8276-124-A	MOUNTED PCB, KY-11	
54	⚠*1-413-547-11	REGULATOR, SWITCHING(PU-2E)	
55	*3-642-310-00	HOLDER BOARD	
56	*3-741-035-03	FRAME M	

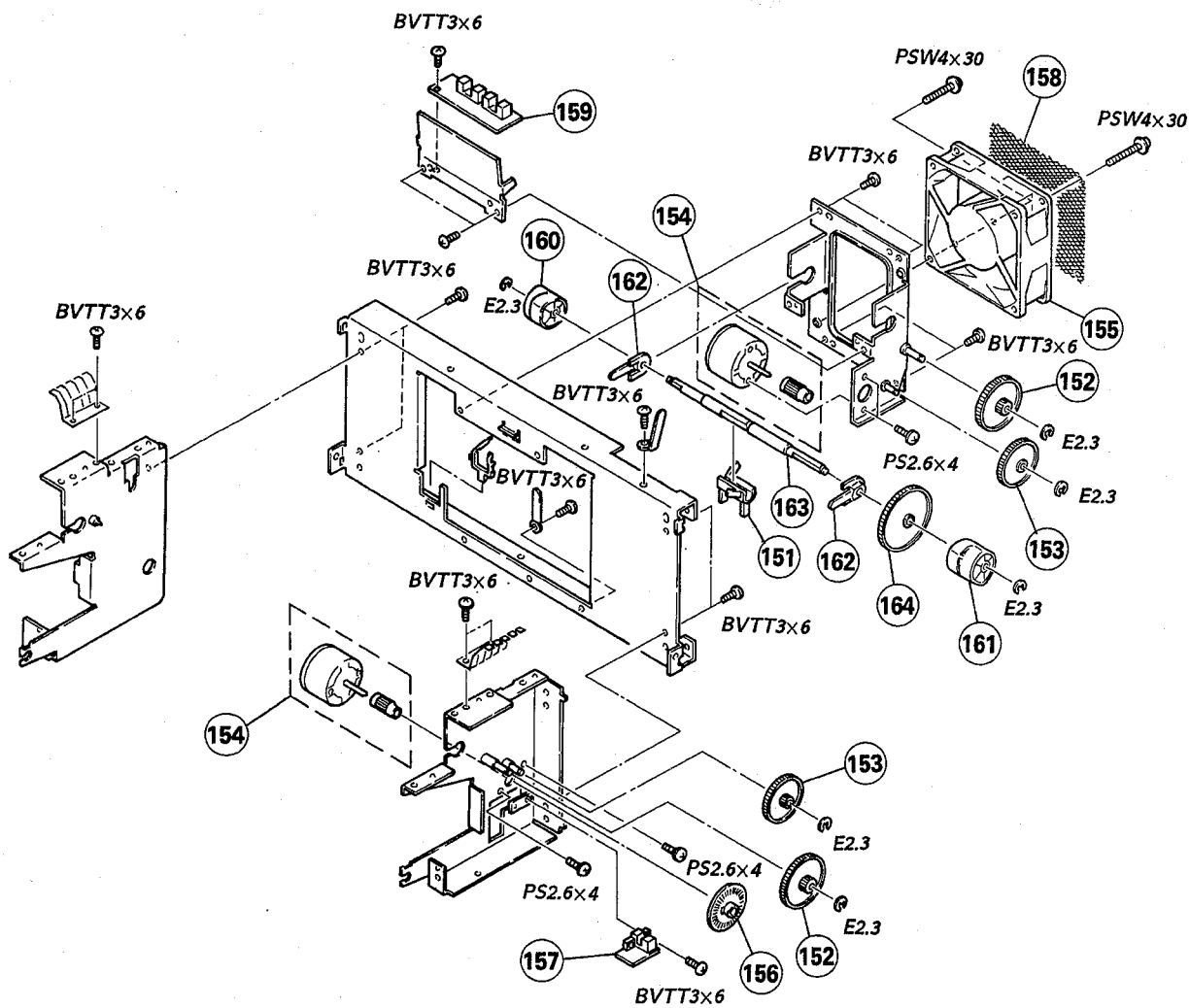
4-3. MECHANICAL BLOCK(1)



Ref.No	Part No.	Description	Remark
101	*3-741-007-01	SHAFT, HP	
102	*3-741-022-01	CHASSIS, TOP	
103	*3-741-006-01	PLATE(LEFT), PRESS, H	
104	*3-741-005-01	PLATE(RIGHT), PRESS, H	
105	3-741-037-01	SPRING, COMPRESSION	
106	*3-741-030-01	HEAT SINK	
107	*X-3714-942-1	HOLDER (LEFT) BLOCK ASSY, H	
108	*X-3714-941-1	HOLDER (RIGHT) BLOCK ASSY, H	
109	1-543-748-11	HEAD, THERMAL (TH47607)	
110	3-734-886-01	BEARING, PLATEN	

Ref.No	Part No.	Description	Remark
111	3-741-028-01	PLATEN	
112	3-734-887-01	GEAR, PLATEN	
113	3-741-019-01	SHAFT, PAPER ROLLER	
114	3-741-036-01	BEARING, ROLLER	
115	3-734-894-01	BEARING, PAPER SHAFT	
116	3-741-033-01	GUIDE (A), PAPER	
117	3-741-034-01	GUIDE (B), PAPER	
118	1-808-706-21	SENSOR, PHOTO(ACTUATOR)	
119	*3-741-131-02	BEARING, HH	

4-4. MECHANICAL BLOCK(2)



Ref.No	Part No.	Description	Remark
151	3-741-040-01	ARM, HUD SENSOR	
152	3-734-888-01	GEAR (A)	
153	3-734-889-01	GEAR (B)	
154	X-3329-571-2	MOTOR ASSY	
155	1-541-593-21	MOTOR, DC FAN	
156	3-734-891-11	FIN, FG	
157	*1-635-720-11	SE-7 BOARD	
158	*3-741-038-01	COVER, FAN	
159	*1-635-721-11	SE-8 BOARD	
160	3-741-024-01	CAM (LEFT), HEAD	

Ref.No	Part No.	Description	Remark
161	3-741-023-01	CAM (RIGHT), HEAD	
162	3-734-886-01	BEARING, PLATEN	
163	*3-741-025-01	SHAFT, HEAD	
164	3-734-887-01	GEAR, PLATEN	

MA-13

SECTION 5
ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

- Items marked "＊" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No.	Part No.	Description			Remark
	*A-8271-075-A	MA-13 BOARD COMPLETE **********			
		CAPACITORS			
C1	1-126-176-11	ELECT	220MF	20%	10V
C2	1-163-090-00	CERAMIC CHIP	7PF	0.25PF	50V
C3	1-163-090-00	CERAMIC CHIP	7PF	0.25PF	50V
C4	1-124-478-11	ELECT	100MF	20%	25V
C5	1-163-086-00	CERAMIC CHIP	3PF	0.25PF	50V
C6	1-163-085-00	CERAMIC CHIP	2PF	0.25PF	50V
C7	1-163-088-00	CERAMIC CHIP	5PF	0.25PF	50V
C8	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C9	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C10	1-131-345-00	TANTALUM	0.47MF	10%	35V
C11	1-123-382-00	ELECT	3.3MF	20%	50V
C12	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C13	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C14	1-124-477-11	ELECT	47MF	20%	25V
C15	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C16	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C17	1-163-101-00	CERAMIC CHIP	22PF	5%	50V
C18	1-130-499-00	FILM	0.2MF	5%	50V
C19	1-124-791-11	ELECT	1MF	20%	50V
C20	1-163-121-00	CERAMIC CHIP	150PF	5%	50V
C21	1-130-471-00	MYLAR	0.001MF	5%	50V
C22	1-123-875-11	ELECT	10MF	20%	50V
C23	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C24	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C25	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C26	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C27	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C28	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C29	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C30	1-123-875-11	ELECT	10MF	20%	50V
C31	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C32	1-123-875-11	ELECT	10MF	20%	50V
C33	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C34	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C35	1-123-875-11	ELECT	10MF	20%	50V
C36	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C37	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C38	1-123-875-11	ELECT	10MF	20%	50V
C39	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C40	1-124-791-11	ELECT	1MF	20%	50V
C41	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C42	1-163-093-00	CERAMIC CHIP	10PF	5%	50V
C43	1-124-791-11	ELECT	1MF	20%	50V
C44	1-124-472-11	ELECT	470MF		10V
C45	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C46	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C47	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C48	1-163-038-00	CERAMIC CHIP	100MF	20%	25V
C49	1-124-478-11	ELECT	18PF	5%	50V
C101	1-163-099-00	CERAMIC CHIP	18PF	5%	50V
C102	1-163-099-00	CERAMIC CHIP	33PF	5%	50V
C103	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C104	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C105	1-163-105-00	CERAMIC CHIP	0.001MF	5%	50V
C106	1-163-141-00	CERAMIC CHIP	0.0015MF	5%	50V
C107	1-163-145-00	CERAMIC CHIP	0.0022MF	5%	50V
C108	1-130-475-00	MYLAR	0.001MF	5%	50V
C109	1-130-471-00	MYLAR	0.001MF	5%	50V
C110	1-130-471-00	MYLAR	0.001MF	5%	50V
C111	1-163-141-00	CERAMIC CHIP	0.047MF	5%	50V
C112	1-130-491-00	MYLAR	33PF	5%	50V
C201	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C202	1-163-105-00	CERAMIC CHIP	10MF	20%	50V
C203	1-123-875-11	ELECT	33PF	5%	50V
C301	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C302	1-163-105-00	CERAMIC CHIP	33PF	5%	50V
C304	1-163-105-00	CERAMIC CHIP	0.1MF	5%	50V
C401	1-130-495-00	FILM	0.01MF	10%	50V
C402	1-164-232-11	CERAMIC CHIP	0.1MF	5%	50V
C403	1-130-495-00	FILM	10MF	20%	50V
C404	1-123-875-11	ELECT	0.1MF		25V
C405	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C406	1-163-038-00	CERAMIC CHIP	0.01MF	10%	50V
C407	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V
C408	1-164-232-11	CERAMIC CHIP	3.3MF	10%	10V
C409	1-131-368-00	TANTALUM	10MF	20%	50V
C410	1-123-875-11	ELECT	100MF	20%	25V
C451	1-124-478-11	ELECT	0.1MF		25V
C452	1-163-038-00	CERAMIC CHIP	100MF	20%	25V
C453	1-124-478-11	ELECT	0.1MF		25V
C454	1-163-038-00	CERAMIC CHIP	47MF	20%	25V
C455	1-124-477-11	ELECT	100MF	20%	25V
C456	1-124-478-11	ELECT	100MF	20%	25V
C457	1-124-478-11	ELECT	0.1MF		25V
C458	1-163-038-00	CERAMIC CHIP	47MF	20%	25V
C459	1-124-477-11	ELECT	0.1MF		25V
C460	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C701	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C702	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C703	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C704	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C705	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C706	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C707	1-163-038-00	CERAMIC CHIP	0.1MF		25V

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Ref.No.	Part No.	Description			Remark
C708	1-163-038-00	CERAMIC CHIP			
			0.1MF		25V
C709	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C710	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C711	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C712	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C713	1-163-038-00	CERAMIC CHIP			
			0.1MF		25V
C714	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C715	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C716	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C717	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C718	1-163-038-00	CERAMIC CHIP			
			0.1MF		25V
C719	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C720	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C721	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C722	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C723	1-163-038-00	CERAMIC CHIP			
			100MF	20%	25V
C751	1-124-478-11	ELECT	470MF		10V
C752	1-124-472-11	ELECT	10MF	20%	50V
C753	1-123-875-11	ELECT	47MF	20%	25V
C754	1-124-477-11	ELECT	10MF	20%	50V
C755	1-123-875-11	ELECT			
			47MF	20%	25V
C756	1-124-477-11	ELECT	47MF	20%	25V
C757	1-124-477-11	ELECT			

CONNECTOR

CN1	1-506-469-11	PIN, CONNECTOR 4P
CN2	1-506-467-11	PIN, CONNECTOR 2P
CN3	*1-506-474-11	PIN, CONNECTOR 9P
CN4	*1-560-893-00	PIN, CONNECTOR 5P
CN5	*1-560-890-00	PIN, CONNECTOR 2P
CN201	1-506-471-11	PIN, CONNECTOR 6P
CN202	1-506-473-11	PIN, CONNECTOR 8P
CN203	*1-560-900-00	PIN, CONNECTOR 12P
CN301	1-562-966-21	SOCKET, CONNECTOR 22P
CN401	1-506-468-11	PIN, CONNECTOR 3P
CN402	1-506-467-11	PIN, CONNECTOR 2P
CN403	1-506-467-11	PIN, CONNECTOR 2P
CN404	1-506-468-11	PIN, CONNECTOR 3P
CN405	1-506-469-11	PIN, CONNECTOR 4P
CN406	*1-560-891-00	PIN, CONNECTOR 3P
CN407	*1-564-915-11	PIN, CONNECTOR 7P

HYBRID CIRCUIT

CPD201	1-233-189-11	RD5.6ES-B1×7
CPD202	1-233-189-11	RD5.6ES-B1×7
CPR201	1-233-165-11	3.3K×7
CPR202	1-233-165-11	3.3K×7
CPR203	1-232-976-11	10K×8
CPR204	1-232-976-11	10K 8
CPR401	1-233-164-11	3.3K 5

Ref.No.	Part No.	Description	Remark

DIODE

D1	8-719-105-91	DIODE RD5.6M-B2
D2	8-719-801-78	DIODE 1SS184
D3	8-719-106-44	DIODE RD9.1M-B2
D4	8-719-106-44	DIODE RD9.1M-B2
D5	8-719-105-91	DIODE RD5.6M-B2
D6	8-719-105-91	DIODE RD5.6M-B2
D7	8-719-801-78	DIODE 1SS184
D201	8-719-105-52	DIODE RD3.6M-B2
D202	8-719-105-91	DIODE RD5.6M-B2

FERRITE BEAD RING

FB1	1-410-397-21	FERRITE BEAD INDUCTOR
FB2	1-410-397-21	FERRITE BEAD INDUCTOR
FB3	1-410-397-21	FERRITE BEAD INDUCTOR
FB4	1-410-397-21	FERRITE BEAD INDUCTOR

IC

IC1	8-759-304-10	IC HA11465A
IC2	8-759-040-53	IC MC14053BCP
IC3	8-759-978-95	IC TL5501CN
IC4	8-759-939-10	IC MB40776P
IC5	8-759-900-04	IC SN74LS04N
IC101	8-759-140-94	IC CXD1332P
IC102	8-759-902-21	IC SN74LS221N
IC103	8-759-901-23	IC SN74LS123N
IC104	8-759-916-29	IC SN74HC74N
IC105	8-759-900-74	IC SN74LS74AN
IC106	8-759-916-12	IC SN74HC00N
IC201	8-752-813-07	IC CXP50P48HQ
IC202	8-759-504-38	IC UPD65012GB-589-3B4
IC301	8-759-145-41	IC UPD65031GF-395-3B9
IC302	8-752-332-15	IC CXK1206M
IC303	8-752-332-15	IC CXK1206M
IC304	8-752-332-15	IC CXK1206M
IC305	8-752-322-06	IC CXK5814P-35L
IC306	8-759-989-73	IC SN74LS257BN
IC307	8-759-989-73	IC SN74LS257BN
IC401	8-759-600-69	IC CX-069A
IC402	8-759-115-55	IC UPC1555C
IC403	8-759-916-20	IC SN74HC14N
IC404	8-759-600-24	IC M54543L
IC451	8-759-982-10	IC RC7809FA

JACK

J101	1-507-967-11	JACK (REMOTE)

COIL

L1	1-410-470-11	INDUCTOR	10UH
L2	1-408-397-00	INDUCTOR	1UH
L3	1-410-470-11	INDUCTOR	10UH
L4	1-235-096-00	FILTER, LINE	
L5	1-235-096-00	FILTER, LINE	

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Ref.No.	Part No.	Description		Remark
L101	1-410-470-11	INDUCTOR	10UH	
L102	1-410-068-11	INDUCTOR	5.6MMH	
L201	1-236-129-11	FILTER, EMI		
L202	1-236-129-11	FILTER, EMI		
L203	1-236-129-11	FILTER, EMI		
L204	1-236-129-11	FILTER, EMI		
L205	1-236-129-11	FILTER, EMI		
L206	1-236-129-11	FILTER, EMI		
L207	1-236-129-11	FILTER, EMI		
L208	1-236-129-11	FILTER, EMI		
L209	1-236-129-11	FILTER, EMI		
L210	1-236-129-11	FILTER, EMI		
L211	1-236-129-11	FILTER, EMI		
L212	1-236-129-11	FILTER, EMI		
L213	1-236-129-11	FILTER, EMI		
L214	1-236-129-11	FILTER, EMI		

VARIABLE COIL

LV1	1-409-193-00	COIL, TRAP 3.58MHz	

TRANSISTOR

Q1	8-729-271-22	TRANSISTOR 2SC2712G	
Q2	8-729-271-22	TRANSISTOR 2SC2712G	
Q3	8-729-271-22	TRANSISTOR 2SC2712G	
Q4	8-729-271-22	TRANSISTOR 2SC2712G	
Q5	8-729-271-22	TRANSISTOR 2SC2712G	
Q6	8-729-216-22	TRANSISTOR 2SA1162G	
Q7	8-729-271-22	TRANSISTOR 2SC2712G	
Q8	8-729-271-22	TRANSISTOR 2SC2712G	
Q9	8-729-216-22	TRANSISTOR 2SA1162G	
Q10	8-729-216-22	TRANSISTOR 2SA1162G	
Q11	8-729-216-22	TRANSISTOR 2SA1162G	
Q12	8-729-271-22	TRANSISTOR 2SC2712G	
Q13	8-729-271-22	TRANSISTOR 2SC2712G	
Q14	8-729-271-22	TRANSISTOR 2SC2712G	
Q15	8-729-271-22	TRANSISTOR 2SC2712G	
Q16	8-729-901-00	TRANSISTOR DTC124EK	
Q201	8-729-271-22	TRANSISTOR 2SC2712G	
Q202	8-729-271-22	TRANSISTOR 2SC2712G	
Q203	8-729-901-00	TRANSISTOR DTC124EK	
Q204	8-729-901-00	TRANSISTOR DTC124EK	
Q401	8-729-901-05	TRANSISTOR DTA124EK	
Q402	8-729-901-05	TRANSISTOR DTA124EK	
Q403	8-729-901-00	TRANSISTOR DTC124EK	
Q404	8-729-188-23	TRANSISTOR 2SD882-P	
Q405	8-729-140-96	TRANSISTOR 2SD774-34	
Q406	8-729-901-00	TRANSISTOR DTC124EK	
Q407	8-729-140-96	TRANSISTOR 2SD774-34	

RESISTOR

R1	1-216-029-00	METAL GLAZE	150	5%	1/10W
R2	1-216-029-00	METAL GLAZE	150	5%	1/10W
R3	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R4	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R5	1-216-025-00	METAL GLAZE	100	5%	1/10W
R6	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R7	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R8	1-216-025-00	METAL GLAZE	100	5%	1/10W
R9	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R10	1-216-025-00	METAL GLAZE	100	5%	1/10W
R11	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R12	1-216-025-00	METAL GLAZE	100	5%	1/10W
R13	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R14	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R15	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R16	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R17	1-216-045-00	METAL GLAZE	680	5%	1/10W
R18	1-216-095-00	METAL GLAZE	82K	5%	1/10W
R19	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R20	1-216-033-00	METAL GLAZE	220	5%	1/10W
R21	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R22	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R23	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R24	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R25	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R26	1-216-013-00	METAL GLAZE	33	5%	1/10W
R27	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R28	1-216-041-00	METAL GLAZE	470	5%	1/10W
R29	1-216-041-00	METAL GLAZE	470	5%	1/10W
R30	1-216-037-00	METAL GLAZE	330	5%	1/10W
R31	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R32	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R33	1-216-295-00	METAL GLAZE	0	5%	1/10W
R34	1-216-061-00	METAL GRAZE	3.3K	5%	1/10W
R35	1-216-037-00	METAL GLAZE	330	5%	1/10W
R36	1-216-037-00	METAL GLAZE	330	5%	1/10W
R37	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R38	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R39	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R40	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R41	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R42	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R43	1-216-023-00	METAL GLAZE	82	5%	1/10W
R44	1-216-295-00	METAL GLAZE	0	5%	1/10W
R45	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R46	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R47	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R48	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R49	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R50	1-216-029-00	METAL GLAZE	150	5%	1/10W
R51	1-216-031-00	METAL GLAZE	180	5%	1/10W
R52	1-216-035-00	METAL GLAZE	270	5%	1/10W
R53	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R54	1-216-041-00	METAL GLAZE	470	5%	1/10W
R55	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R56	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R57	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R58	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R59	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R60	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R61	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R62	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R63	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R64	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W
R65	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W

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Ref.No.	Part No.	Description			Remark
R66	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R67	1-216-021-00	METAL GLAZE	68	5%	1/10W
R68	1-216-033-00	METAL GLAZE	220	5%	1/10W
R69	1-216-021-00	METAL GLAZE	68	5%	1/10W
R70	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R71	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R72	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R73	1-216-025-00	METAL GLAZE	100	5%	1/10W
R74	1-216-025-00	METAL GLAZE	100	5%	1/10W
R75	1-216-033-00	METAL GLAZE	220	5%	1/10W
R101	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R102	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R103	1-216-013-00	METAL GLAZE	33	5%	1/10W
R104	1-216-013-00	METAL GLAZE	33	5%	1/10W
R105	1-216-025-00	METAL GLAZE	100	5%	1/10W
R106	1-216-025-00	METAL GLAZE	100	5%	1/10W
R107	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R108	1-216-085-00	METAL GLAZE	33K	5%	1/10W
R109	1-216-748-11	METAL GLAZE	39K	5%	1/10W
R110	1-216-748-11	METAL GLAZE	39K	5%	1/10W
R111	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R112	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R113	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R115	1-216-295-00	METAL GLAZE	0	5%	1/10W
R201	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R202	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R203	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R204	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R205	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R206	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R207	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R208	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R209	1-216-033-00	METAL GLAZE	220	5%	1/10W
R210	1-216-041-00	METAL GLAZE	470	5%	1/10W
R211	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R212	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R213	1-216-037-00	METAL GLAZE	330	5%	1/10W
R214	1-216-037-00	METAL GLAZE	330	5%	1/10W
R215	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R216	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R217	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R301	1-216-013-00	METAL GLAZE	33	5%	1/10W
R302	1-216-013-00	METAL GLAZE	33	5%	1/10W
R304	1-216-021-00	METAL GLAZE	68	5%	1/10W
R305	1-216-295-00	METAL GLAZE	0	5%	1/10W
R401	1-216-095-00	METAL GLAZE	82K	5%	1/10W
R402	1-216-089-00	METAL GLAZE	47K	5%	1/10W
R403	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W
R404	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R405	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R406	1-216-077-00	METAL GLAZE	15K	5%	1/10W
R407	1-216-041-00	METAL GLAZE	470	5%	1/10W
R408	1-249-478-11	CARBON	2.2	5%	1/2W
R409	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R410	1-216-041-00	METAL GLAZE	470	5%	1/10W
R411	1-249-478-11	CARBON	2.2	5%	1/2W
R412	1-249-478-11	CARBON	2.2	5%	1/2W
R413	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R414	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R415	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R416	1-216-033-00	METAL GLAZE	220	5%	1/10W
R417	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R419	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R420	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R422	1-216-029-00	METAL GLAZE	150	5%	1/10W
R423	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R424	1-216-031-00	METAL GLAZE	180	5%	1/10W

VARIABLE RESISTOR

RV1	1-228-989-00	RES, ADJ, METAL GLAZE (CONTR) 470
RV2	1-228-993-00	RES, ADJ, METAL GLAZE (BLACK LEVEL) 4.7K
RV3	1-228-993-00	RES, ADJ, METAL GLAZE (DITHER) 4.7K
RV101	1-228-994-00	RES, ADJ, METAL GLAZE (VD) 10K
RV401	1-228-995-00	RES, ADJ, METAL GLAZE (MOTOR) 22K
RV402	1-228-993-00	RES, ADJ, METAL GLAZE (TEMP) 4.7K

SWITCH

S1	1-553-725-00	SWITCH, SLIDE (7S ON/OFF)

CRYSTAL

X101	1-567-905-21	CRYSTAL, 13.875MHz
X201	1-567-192-11	CERAMIC, 4MHz

****

	*1-635-720-11	SE-7 BOARD
		**********
	*1-569-193-11	TERMINAL, SOLDERLESS
	*1-569-196-11	HOUSING, CONNECTOR 3P

CONNECTOR

CN602	*1-946-431-11	HARNESS (I)

DIODE

D653	8-719-800-95	DIODE TLP805

****

	*1-635-721-11	SE-8 BOARD
		**********
	*1-569-193-11	TERMINAL, SOLDERLESS
	*1-569-197-11	HOUSING, CONNECTOR 4P

SE-8 LE-5 KY-11 FU-1 PU-2E

Ref.No.	Part No.	Description	Remark
		CONNECTOR	
CN601	*1-946-434-11	HARNESS (L)	
		DIODE	
D651	8-719-820-85	PHOTO INTERRUPTER TLP806	
D652	8-719-820-85	PHOTO INTERRUPTER TLP806	
		RESISTOR	
R601	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R602	1-216-033-00	METAL GLAZE 220 5% 1/10W	
**********			
	*1-635-722-11	LE-5 BOARD **********	
	*1-569-193-11	TERMINAL, SOLDERLESS	
	*1-569-195-11	HOUSING, CONNECTOR 2P	
		CONNECTOR	
CN603	*1-946-427-11	HARNESS (E)	
		DIODE	
D601	8-719-802-29	DIODE TLG211	
**********			
	*A-7276-124-A	KY-11 BOARD, COMPLETE **********	
	*1-569-193-11	TERMINAL, SOLDERLESS	
	*1-569-193-11	TERMINAL, SOLDERLESS	
	*1-569-193-11	TERMINAL, SOLDERLESS	
	*1-569-199-11	HOUSING, CONNECTOR 6P	
	*1-569-201-11	HOUSING, CONNECTOR 8P	
	*1-569-202-31	HOUSING, CONNECTOR 9P	
		CONNECTOR	
CN501	*1-946-429-11	HARNESS (G)	
CN502	*1-946-430-11	HARNESS (H)	
CN503	*1-946-428-11	HARNESS (F)	
		DIODE	
D501	8-719-975-79	DIODE SLP255B-51-A (HEAD RELEASE)	
D502	8-719-940-89	DIODE SLP655B-50 (PAPER EMPTY)	

Ref.No.	Part No.	Description	Remark
		RESISTOR	
R501	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R502	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R503	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R504	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R507	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R508	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R509	1-216-295-00	METAL GLAZE 0 5% 1/10W	
R510	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R511	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R512	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R513	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R514	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R515	1-216-025-00	METAL GLAZE 100 5% 1/10W	
R516	1-216-025-00	METAL GLAZE 100 5% 1/10W	
		VARIABLE RESISTOR	
RV501	1-241-209-11	VOLUME RK09K113 (CONTRAST) 10K	
RV502	1-241-209-11	VOLUME RK09K113 (BRIGHT) 10K	
		SWITCH	
S501	1-570-282-21	SWITCH, KEYBOARD (FEED)	
S502	1-570-282-21	SWITCH, KEYBOARD (COPY)	
S503	1-570-282-21	SWITCH, KEYBOARD (PRINT)	
S504	1-552-539-00	SWITCH, KEYBOARD (HEAD SET/RELEASE)	
S505	1-572-480-11	SWITCH, DIP	
**********			
	*A-8276-126-A	FU-1 BOARD, COMPLETE **********	
		CAPACITOR	
C801	1-136-185-00	FILM 0.22MF 20% 250V	
		FUSE	
F801	1-532-350-00	FUSE 250V	
F802	1-532-350-00	FUSE 250V	
		COIL	
L801	1-424-357-11	COIL, CHOKE 2.0MMH	
**********			
	*1-413-547-11	REGULATOR, SWITCHING (PU-2E) **********	
	*9-997-668-01	PU-2E BOARD	
	*9-996-920-01	SHEET, INSULATING	
	*9-996-921-01	SHEET, INSULATING	
⚠	9-996-514-01	CLIP, FUSE	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

PU-2E

Ref.No.	Part No.	Description		Remark
		CAPACITOR		
C901	9-997-657-01	ELECT	1000MF	25V
C902	1-126-589-11	ELECT	2200MF	16V
C903	1-130-528-11	FILM	0.1MF	50V
C904	1-126-589-11	ELECT	2200MF	16V
C911	9-997-657-01	ELECT	1000MF	25V
C912	9-997-658-01	ELECT	2200MF	10V
C913	1-130-528-11	FILM	0.1MF	50V
C914	1-126-588-11	ELECT	1000MF	16V
C921	9-997-659-01	CERAMIC	1000PF	1KV(DC)
C922	9-997-659-01	CERAMIC	1000PF	1KV(DC)
C923-1	9-997-660-01	ELECT	1800MF	25V
C923-2	9-997-660-01	ELECT	1800MF	25V
C926	1-130-528-11	FILM	0.1MF	50V
C927	9-997-661-01	ELECT	4700MF	25V
C931	1-126-375-11	ELECT	100MF	25V
C932	1-126-375-11	ELECT	100MF	25V
C950 ⚠	1-161- -	CERAMIC	1000PF	250V
C951 ⚠	1-161- -	CERAMIC	1000PF	250V
C953 ⚠	- - -	CERAMIC	470PF	
C954 ⚠	9-997-662-01	FILM	0.47MF	
C955 ⚠	9-997-662-01	FILM	0.47MF	
C956 ⚠	9-997-663-01	FILM	0.1MF	
C960	9-997- -	ELECT	470MF	400V
C965	1-130-528-11	FILM	0.1MF	50V
C966	1-130-201-21	FILM	0.22MF	400V
C967	1-102-249-12	CERAMIC	680PF	2KV(DC)
C968	9-997-667-01	CERAMIC	100PF	2KV(DC)
C970	1-126-802-11	ELECT	10MF	50V
C971	1-130-528-11	FILM	0.1MF	50V
C972	9-997-665-01	ELECT	100MF	10V
C973	1-130-487-00	FILM	0.022MF	50V
C974	1-130-528-11	FILM	0.1MF	50V
C975	9-997-666-01	ELECT	33MF	50V
C976	1-126-804-11	ELECT	100MF	50V
C977	1-130-528-11	FILM	0.1MF	50V
C980	1-126-807-11	ELECT	1MF	50V
		CONNECTOR		
CN901 ⚠	*1-564-104-11	CONNECTOR		
CN902	*1-564-915-11	CONNECTOR		
CN903	*1-564-007-11	CONNECTOR		
CN904	*1-564-001-41	CONNECTOR		
		DIODE		
D950	1-808-302-11	DIODE D1LN20		
D966	8-719-510-23	DIODE DFG1A8		
D967	8-719-510-23	DIODE DFG1A8		
D971	8-719-510-17	DIODE S2LA20		
DZ911	9-997-634-01	ZENER RD6.2FB-2		
DZ970	9-997-635-01	ZENER HZ22-3		
DZ980	8-719-911-12	ZENER HZ11B-2		
DZ981	8-719-911-12	ZENER HZ11B-2		
RF921	9-996-499-01	DIODE ESAC93-02		
RF922	9-996-499-01	DIODE ESAC93-02		
RF950	8-719-500-16	DIODE D5SB60		
TH950	8-719-114-23	DIODE AC10DGM		
		FUSE		
F901	1-576-106-11	FUSE 3A		
F911	1-576-106-11	FUSE 3A		
F950 ⚠	1-576-	FUSE 4A		
		COIL		
L901	9-996-528-01	CHOKE COIL		
L902	9-997-632-01	CHOKE COIL		
L911	9-996-528-01	CHOKE COIL		
L912	9-997-632-01	CHOKE COIL		
L921	9-997-631-01	CHOKE COIL		
L952 ⚠	9-997-630-01	CHOKE COIL		
L953 ⚠	9-997-630-01	CHOKE COIL		
		IC		
H970	9-997-638-01	IC RHA18-1		
M901	9-997-636-01	IC YDS212		
M911	9-997-636-01	IC YDS212		
M931	9-997-637-01	IC HA178M12W		
M980	8-759-420-19	IC AN1431T		
		PHOTO COUPLER		
PC970 ⚠	9-997-639-01	PHOTO COUPLER PC111		
PC971 ⚠	9-997-639-01	PHOTO COUPLER PC111		
		TRANSISTOR		
Q950	9-997-633-01	TRANSISTOR 2SK725		
Q970	8-729-904-24	TRANSISTOR 2SD1788		
		RESISTOR		
R901	1-247-513-11	CARBON	1K	1/4W
R911	1-247-507-11	CARBON	560	1/4W
R921	1-215-907-51	METAL	22	3W
R922	1-215-907-51	METAL	22	3W
R923	1-215-914-51	METAL	330	3W
R950 ⚠	9-997-642-01	METAL	220K	1W
R951 ⚠	9-996-493-01	METAL	12	
R952	1-247-507-11	CARBON	560	1/4W
R953	1-216-473-51	METAL	56	3W
R961	9-997-643-01	METAL	15	1W
R966-1 ⚠	1-215-927-51	METAL	47K	3W
R966-2 ⚠	1-215-927-51	METAL	47K	3W
R967 ⚠	1-215-907-51	METAL	22	3W
R968 ⚠	9-997-	METAL	0.22	5W
R970-1	9-997-645-01	METAL	68K	2W
R970-2	9-997-645-01	METAL	68K	2W
R971	1-247-479-11	CARBON	39K	1/4W
R972	1-247-489-11	CARBON	100	1/4W
R973	1-247-489-11	CARBON	100	1/4W

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

PU-2E

Ref.No.	Part No.	Description		Remark
R974	1-247-551-11	CARBON	39K	1/4W
R975	1-244-881-11	CARBON	2.2K	1/2W
R980	1-247-489-11	CARBON	100	1/4W
R981	1-244-861-11	CARBON	330	1/2W
R982	1-247-535-11	CARBON	8.2K	1/4W
R983	1-247-513-11	CARBON	1K	1/4W

VARIABLE RESISTOR

RV911	9-997-653-01	RES, ADJ 5K
RV970	9-997-654-01	RES, ADJ 2K
RV981	9-997-655-01	RES, ADJ 2K
RV982	9-997-656-01	RES, ADJ 200

TRANSFORMER

T950	⚠	9-997-629-01	TRANSFORMER

****

MISCELLANEOUS

		1-590-144-11	WIRE, FLAT TYPE (22 CORE)
	⚠	*1-413-547-11	REGULATOR, SWITCHING (PU-2E)
		*1-562-211-11	HOUSING, CONNECTOR 3P
		*1-562-287-11	HOUSING, CONNECTOR 6P
		*1-562-833-11	HOUSING, CONNECTOR 7P
		*1-569-193-11	TERMINAL, SOLDERLESS
		*1-569-195-11	HOUSING, CONNECTOR 2P
		*1-569-197-11	HOUSING, CONNECTOR 4P
		*1-944-814-11	HARNESS (A)
		*1-944-815-11	HARNESS (B)
		*1-946-425-11	HARNESS (C)
		*1-946-426-12	HARNESS (D)
		*1-946-432-11	HARNESS (J)
		*1-946-433-11	HARNESS (K)
		1-543-748-11	HEAD, THERMAL (TH47607)
		1-562-210-11	CONTACT, CONNECTOR
		1-562-261-21	RECEPTACLE, BNC
		1-569-195-11	HOUSING, CONNECTOR 2P
CNJ901	⚠	1-560-222-11	INLET 3P
M951		1-541-593-11	MOTOR DC FAN
M952		X-3329-571-2	MOTOR ASSY
M953		X-3329-571-2	MOTOR ASSY
M954		1-541-593-11	MOTOR DC FAN
S901	⚠	1-554-880-12	SWITCH, PUSH (AC POWER)(1KEY)
S951		1-808-706-21	SENSOR, PHOTO (ACTUATOR)

****

ACCESSORY & PACKING MATERIALS

		1-551-475-31	CABLE ASSY
	⚠	1-556-760-11	CORD, POWER (3 CORE)
		3-734-869-01	SHEET, HEAD CLEANING
		3-741-020-01	SHAFT, PAPER
		3-751-998-12	MANUAL, INSTRUCTION

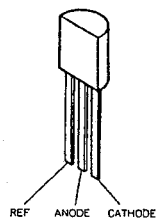
Ref.No.	Part No.	Description	Remark
	*3-165-230-01	INDIVIDUAL CARTON	
	*3-694-922-01	SHEET, PROTECTION	
	*3-741-052-01	CUSHION (UPPER)	
	*3-741-053-01	CUSHION (LOWER)	
	3-701-630-00	BAG, POLYETHYLENE (STANDARD)	
	3-701-623-00	BAG, POLYETHYLENE	
	3-734-880-01	LABEL LOADING, PAPER(G)	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

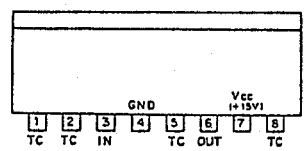
SECTION 6
DIAGRAMS

6-1. SEMICONDUCTOR

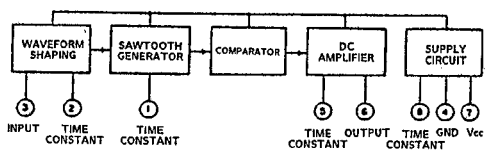
AN1431T



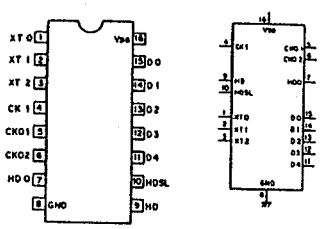
CXO69A (MITSUBISHI)
CXO69A (SONY)
SERVO AMPLIFIER OF MOTOR OF TAPE RECORDERS
— SIDE VIEW —



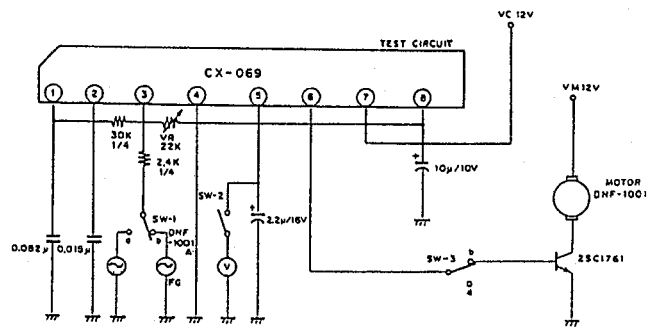
TC: TIME CONSTANT



CXD1332P (SONY)
C-MOS
— TOP VIEW —



CK	: COUNTER CLOCK INPUT
CKO1,02	: EXTERNAL COUNTER CLOCK OUTPUTS
D0~D4	: DATA BUS INPUTS/OUTPUTS
HD	: HD INPUT
HDO	: HD OUTPUT
HDSL	: HD SELECT
XT0~XT2	: XTAL INPUTS/OUTPUTS

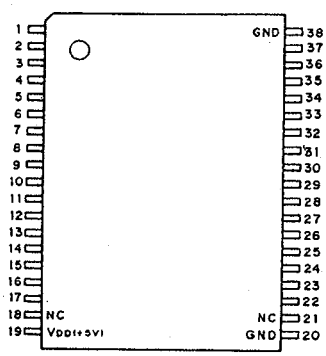


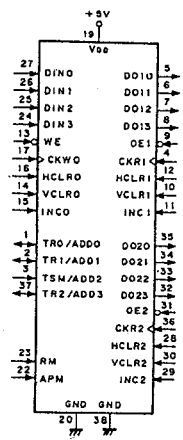
SINE WAVE OSC
1 Vp-p
f = fco + Δf
fco ≈ 450Hz

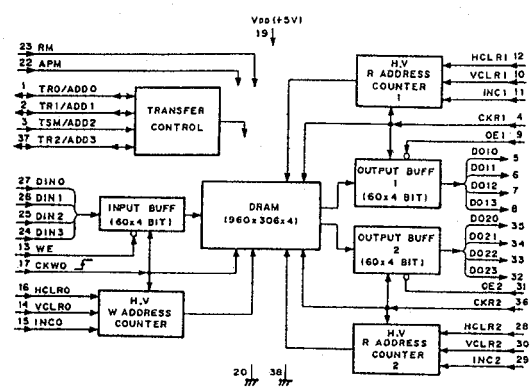
APPLICATION CIRCUIT
① SW-1 → b, SW-2 → OFF, SW-3 → b

F-V CHARACTERISTICS TEST CIRCUIT
② SW-1 → a, SW-2 → ON, SW-3 → a

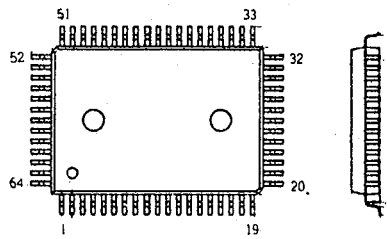
CXK1206M (SONY) FLAT PACKAGE
C-MOS VIDEO FIELD MEMORY (960-COLUMN×306-ROW×4-BIT)
— TOP VIEW —

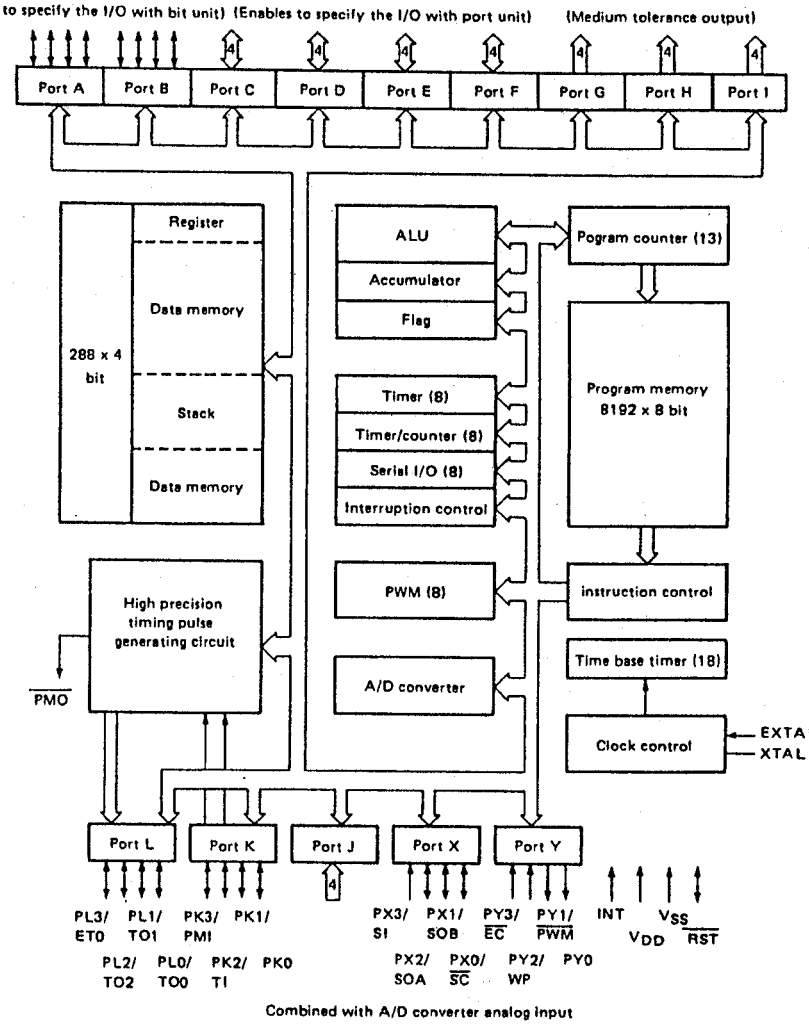




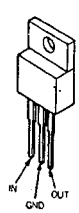


CXP5048 (SONY)
C-MOS 4 BIT 1 CHIP MICROCOMPUTER
— TOP VIEW —

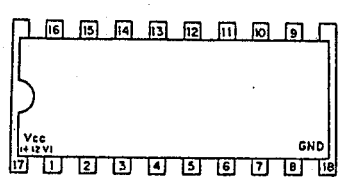


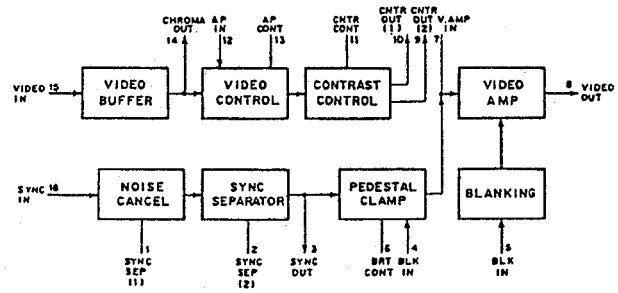


HA178M12P



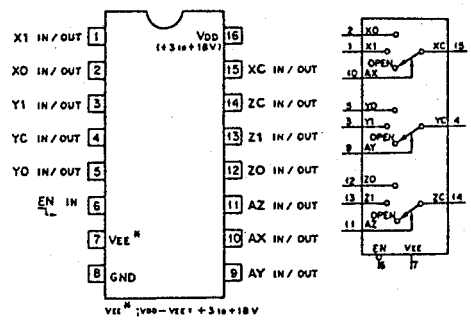
HA11465A (HITACHI)
NTSC COLOR TV VIDEO AMPLIFIER
— TOP VIEW —





AP ; APERTURE
BLK ; BLANKING
BRT ; BRIGHTNESS
CNTR ; CONTRAST
CONT ; CONTROL
SYNC SEP ; SYNCHRONIZATION PULSE SEPARATION
V.AMP ; VIDEO AMPLIFIER

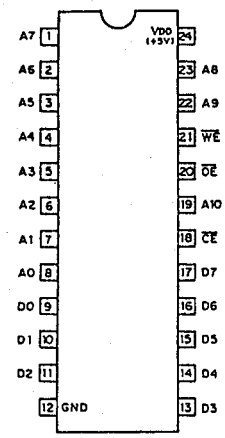
MC14053
C-MOS 2-CHANNEL MULTIPLEXER/DEMULTIPLEXER
— TOP VIEW —

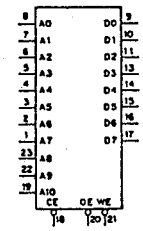


CONT. INPUTS		ON
EN	A (X,Y,Z)	CHANNEL
0	0	0
0	1	1
1	X	OPEN

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE.

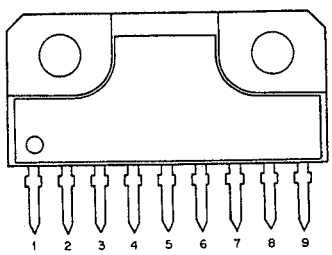
MCM2018BN35 (MOTOROLA) (ACCESS TIME = 35nS)
C-MOS 15K(2K×8) STATIC RAM
— TOP VIEW —

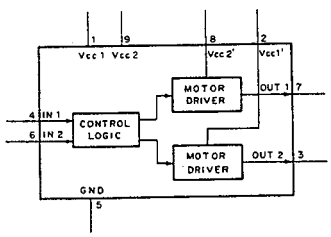




AO ~ A10 ; ADDRESS INPUTS
DO ~ D7 ; DATA INPUTS/OUTPUTS
CE ; CHIP ENABLE INPUT
OE ; OUTPUT ENABLE INPUT
WE ; WRITE ENABLE INPUT

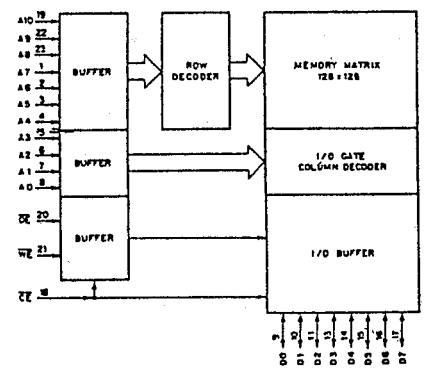
M54543L (MITSUBISHI)
BI-DIRECTIONAL MOTOR DRIVER
— SIDE VIEW —



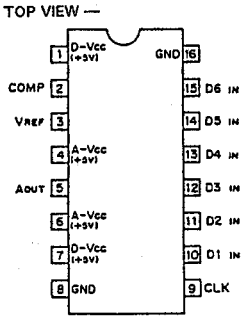


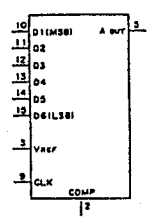
IN		OUT		MODE
1	2	1	2	
0	0	Z	Z	NO OPERATION
1	0	1	0	ROTATION
0	1	0	1	REVERSE ROTATION
1	1	0	0	BRAKE

0 : LOW LEVEL
1 : HIGH LEVEL
Z : HIGH IMPEDANCE

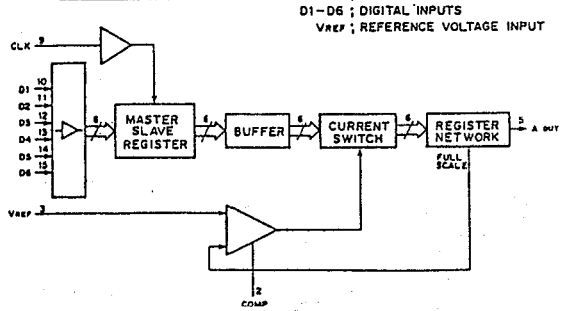


MB40776P (FUJITSU)
6-BIT VIDEO D/A CONVERTER
— TOP VIEW —

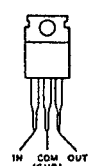


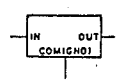


AOUT ; ANALOG OUTPUT
CLK ; CLOCK INPUT
COMP ; COMPENSATION
D1 ~ D6 ; DIGITAL INPUTS
VREF ; REFERENCE VOLTAGE INPUT



RC7809FA
POSITIVE VOLTAGE REGULATOR (1A)
— SIDE VIEW —

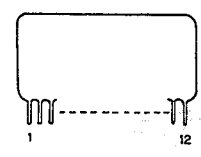




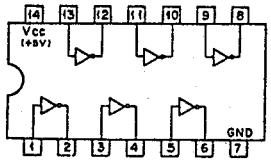
OUTPUT VOLTAGE	AN7877	FS7877	HA17877P	L7877	NJM7877B	NJM7877A/K
+5V	AN7805	FS7805	HA17805P	L7805	---------	NJM7805A/K
+6V	AN7806	-------	HA17806P	-----	---------	NJM7806A/K
+7V	AN7807	-------	HA17807P	L7807	---------	----------
+8V	AN7808	-------	HA17808P	-----	---------	NJM7808A/K
+8.5V	-------	-------	---------	-----	---------	----------
+9V	AN7809	-------	---------	-----	---------	NJM7809A/K
+10V	AN7810	-------	---------	-----	---------	----------
+12V	AN7812	FS7812	HA17812P	-----	NJM7812B	NJM7812A/K
+15V	AN7815	FS7815	HA17815P	-----	---------	NJM7815A/K
+18V	AN7818	-------	HA17818P	-----	---------	NJM7818A/K
+20V	AN7820	-------	---------	-----	---------	NJM7820A/K
+24V	AN7824	FS7824	HA17824P	-----	---------	NJM7824A/K

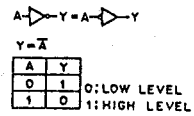
OUTPUT VOLTAGE	uA7877UC	uPC14377H	uPC7877H	TA78777P/AP
+5V	uA7805UC	uPC14305H	uPC7805H	TA78005P/AP
+6V	uA7806UC	---------	--------	TA78006P/AP
+7V	--------	--------	--------	---------
+8V	uA7808UC	uPC14308H	uPC7808H	TA78008P/AP
+8.5V	uA7885UC	---------	--------	---------
+9V	--------	---------	--------	TA78009P/AP
+10V	--------	---------	--------	TA78010P/AP
+12V	uA7812UC	uPC14312H	uPC7812H	TA78012P/AP
+15V	uA7815UC	uPC14315H	uPC7815H	TA78015P/AP
+18V	uA7818UC	uPC14318H	uPC7818H	TA78018P/AP
+20V	--------	---------	--------	TA78020P/AP
+24V	uA7824UC	uPC14324H	uPC7824H	TA78024P/AP

RHA18-1

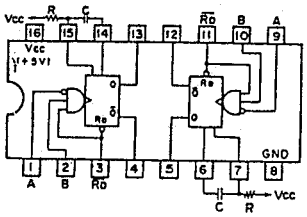


SN74LS04N (TI)
TTL INVERTER
— TOP VIEW —





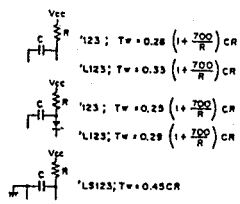
SN74LS123N (TI)
TTL RETRIGGERABLE MONOSTABLE MULTIVIBRATOR WITH DIRECT RESET
— TOP VIEW —



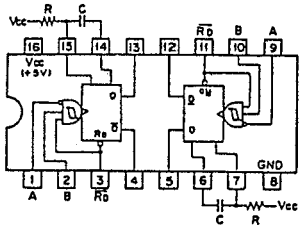
INPUTS			OUTPUTS	
RD	A	B	Q	Q̄
0	X	X	0	1
X	1	X	0	1
X	X	0	0	1
1	0	↓	⊓	⊔
1	↓	1	⊓	⊔
1	0	1	⊓	⊔

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

OUTPUT PULSE WIDTH



SN74LS221N (TI)
TTL MONOSTABLE MULTIVIBRATOR WITH SCHMITT TRIGGER INPUT
— TOP VIEW —

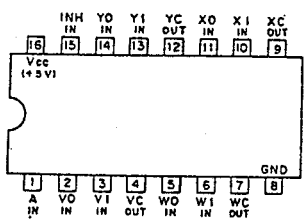


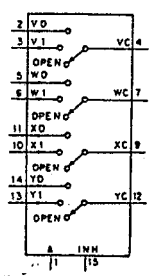
INPUTS			OUTPUTS	
RD	A	B	Q	Q̄
0	X	X	0	1
X	1	X	0	1
X	X	0	0	1
1	0	↓	⊓	⊔
1	↓	1	⊓	⊔
1	0	1	⊓	⊔

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

OUTPUT PULSE WIDTH = 0.7CR

SN74LS257AN (TI)
TTL 2-LINE-TO-1LINE DATA SELECTOR/MULTIPLEXER
— TOP VIEW —

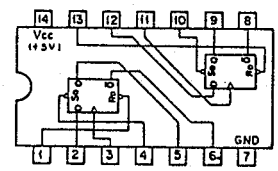




CONT. IN		ON CHANNEL
INH	A	
0	0	0
0	1	1
1	X	OPEN

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

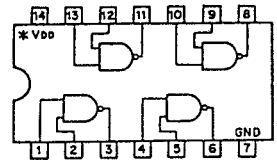
SN74LS74AN (TI)
TC74HC74F (TOSHIBA) FLAT PACKAGE
TTL D-TYPE FLIP FLOP WITH DIRECT SET/RESET
— TOP VIEW —

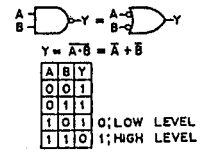


INPUTS				OUTPUTS	
S̄D	R̄D	CK	D	On+1	On+1
0	1	X	X	1	0
1	0	X	X	0	1
0	0	X	X	1*	1*
1	1	⊓	1	1	0
1	1	⊓	0	0	1
1	1	0	X	On	On

0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE
*; NONSTABLE

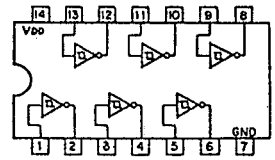
TC74HC00P (TOSHIBA)
C-MOS 2-INPUT NAND GATE
— TOP VIEW —

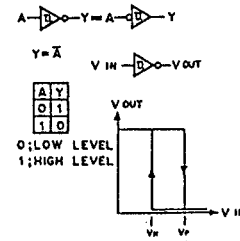




*VDD AC, HC; +2 to +6V
HCT; +5V

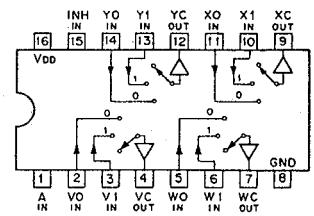
TC74HC14F (TOSHIBA)(VDD = + 2 to + 6V) FLAT PACKAGE
C-MOS SCHMITT TRIGGER INVERTER
— TOP VIEW —

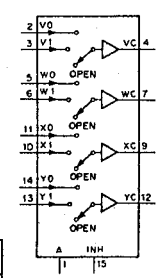




VDD	VH	VL
2.0V	0.75V	1.25V
4.5V	1.9V	2.7V
6.0V	2.6V	3.6V

TC74HC257P (TOSHIBA) (VDD = + 2 to + 6 V)
TTL 2-LINE-TO-1LINE DATA SELECTOR/MULTIPLEXER
— TOP VIEW —

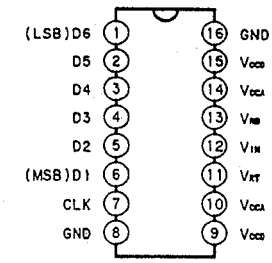


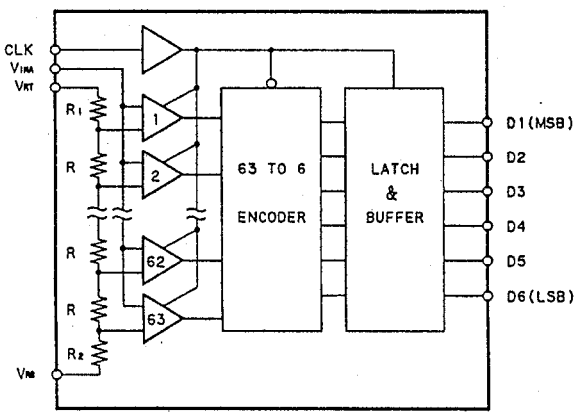


CONT. IN		ON CHANNEL
INH	A	
0	0	0
0	1	1
1	X	OPEN

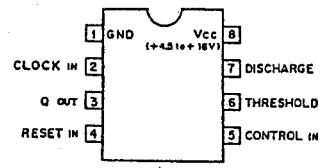
0; LOW LEVEL
1; HIGH LEVEL
X; DON'T CARE

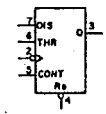
TL5501CN



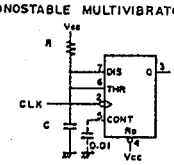


μPC1555C (NEC)
PRECISION TIMER
— TOP VIEW —



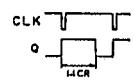


MONOSTABLE MULTIVIBRATOR

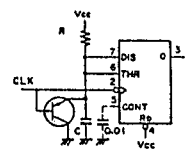


INPUTS		OUT
Rθ	CLK	Q
0	X	0
1	⊓	⊓

0 , LOW LEVEL
1 , HIGH LEVEL
X , DON'T CARE

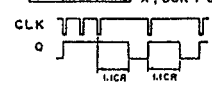


RETRIGGERABLE MONO. MULTIVIBRATOR
(MISSING PULSE DETECTOR)

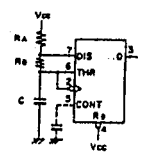


INPUTS		OUT
Rθ	CLK	Q
0	X	0
1	⊓	⊓

0 ; LOW LEVEL
1 ; HIGH LEVEL
X ; DON'T CARE

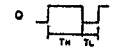


ASTABLE MULTIVIBRATOR



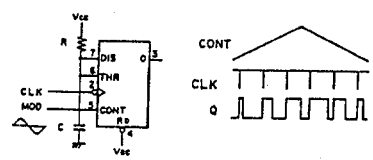
Rθ	Q
0	0
1	⊓

0 ; LOW LEVEL
1 ; HIGH LEVEL

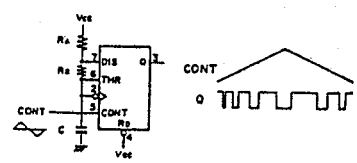


TH = 0.693C (RA+Rθ)
TL = 0.693C Rθ

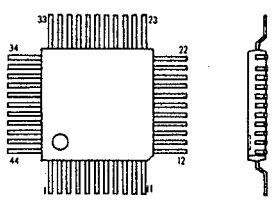
PULSE WIDTH MODULATOR



VCO
(PULSE POSITION MODULATOR)

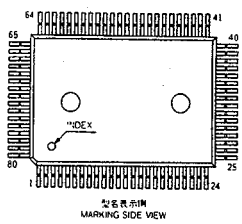


μPD65012GB-589-3B4 (NEC)
GATE ARRAY



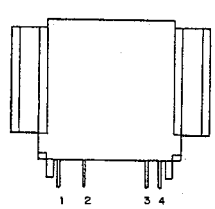
PIN NO.	PIN NAME	PIN NO.	PIN NAME	PIN NO.	PIN NAME	PIN NO.	PIN NAME
1	TST1	12	TTPS	23	FDT3	34	CDT6
2	TSTØ	13	HOLD	24	FDT4	35	CDT7
3	MCK	14	TCLR	25	FDT5	36	CDT8
4	TMPS	15	CHCK	26	FDT6	37	TEMP
5	GND	16	TEST	27	FDT7	38	HDT1
6	DRO	17	GND	28	FDT8	39	VDD
7	VDD	18	TTST	29	CDT1	40	HDT2
8	DR	19	CTL	30	CDT2	41	HDT3
9	STB	20	FDT1	31	CDT3	42	HDT4
10	HCK	21	FDT2	32	CDT4	43	HDT5
11	INTV	22	RST	33	CDT5	44	HDT6

μPD65031GF-395-389 — TOP VIEW —

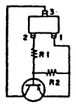


1. SI	11. CPIN	21. PRT4	31. D4	41. AD5	51. HCR0	61. VCR2	71. ADCK
2. VDD	12. INTV	22. GND	32. D5	42. VDD	52. INC0	62. GND	72. DITH
3. GND	13. NEP0	23. VDD	33. GND	43. GND	53. VCR0	63. VDD	73. INEX
4. SCKI	14. FGI	24. PRT5	34. CE	44. AD4	54. WE0	64. CKR2	74. 1221
5. MOTO	15. HCLK	25. PRT6	35. OE	45. AD3	55. HCR1	65. D CLK	75. 1S2N
6. CPST	16. STB0	26. GND	36. WE	46. AD2	56. INC-1	66. HD0	76. ERR
7. FTCH	17. DRO	27. D0	37. AD9	47. AD1	57. VCR1	67. EXTH	77. 3411
8. COPY	18. PRT1	28. D1	38. AD8	48. AD0	58. VMCK	68. MCLK	78. RDWR
9. STBI	19. PRT2	29. D2	39. AD7	49. SELE	59. HCR2	69. EXTV	79. TEST
10. DRI	20. PRT3	30. D3	40. AD6	50. GND	60. INC2	70. FFSF	80. CLR

YDS212

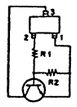


TOP VIEW (SCALE 4/1)



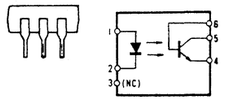
DTA124EK
(R1 = 22K, R2 = 22K)

TOP VIEW (SCALE 4/1)

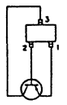


DTC124EK
(R1 = 22K, R2 = 22K)

PC111S

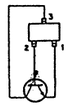


TOP VIEW (SCALE 4/1)



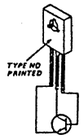
2SA1162

TOP VIEW (SCALE 4/1)



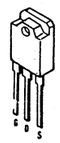
2SC2712-G

2SD774

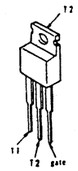


2SD882

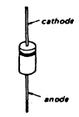
2SK725



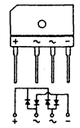
AC10DGM



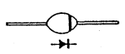
D1NL20
HZ11B2
HZ22-3
RD6.2FB2



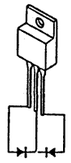
D5SB60



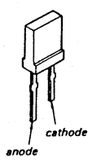
DFG1A8



ESAC93-02



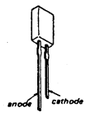
SLP255B
SLP655B



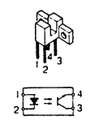
TOP VIEW (SCALE 4/1)

RD3.6M-B2
RD5.6M-B2
RD9.1M-B2

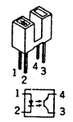
TLG211



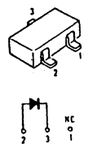
TLP805



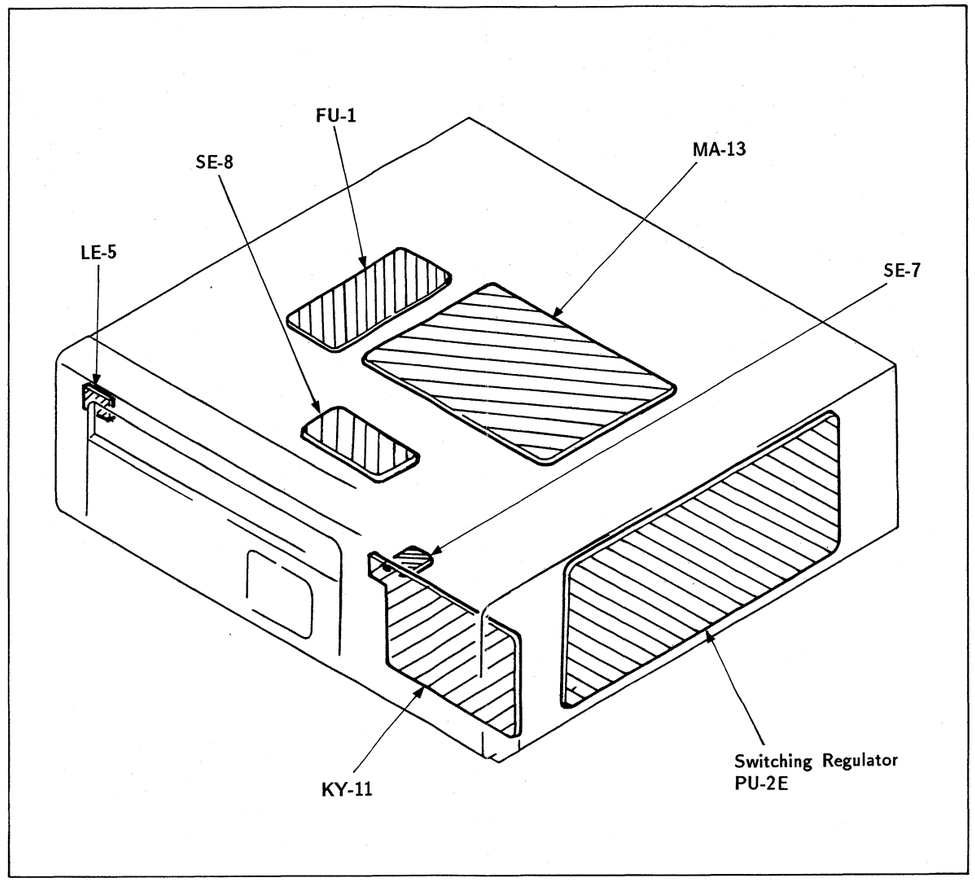
TLP806



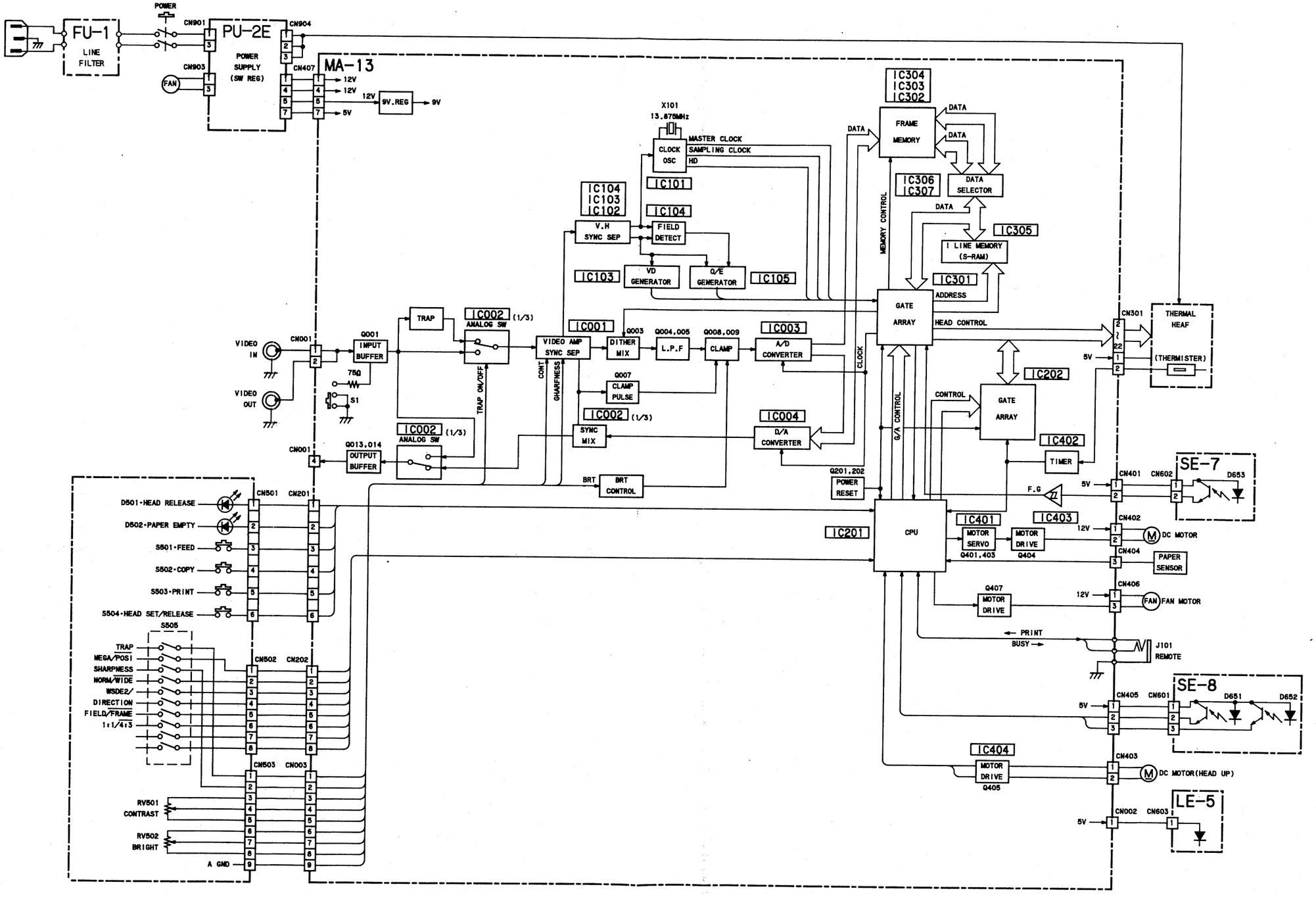
1SS184



6-2. CIRCUIT BOARDS LOCATION



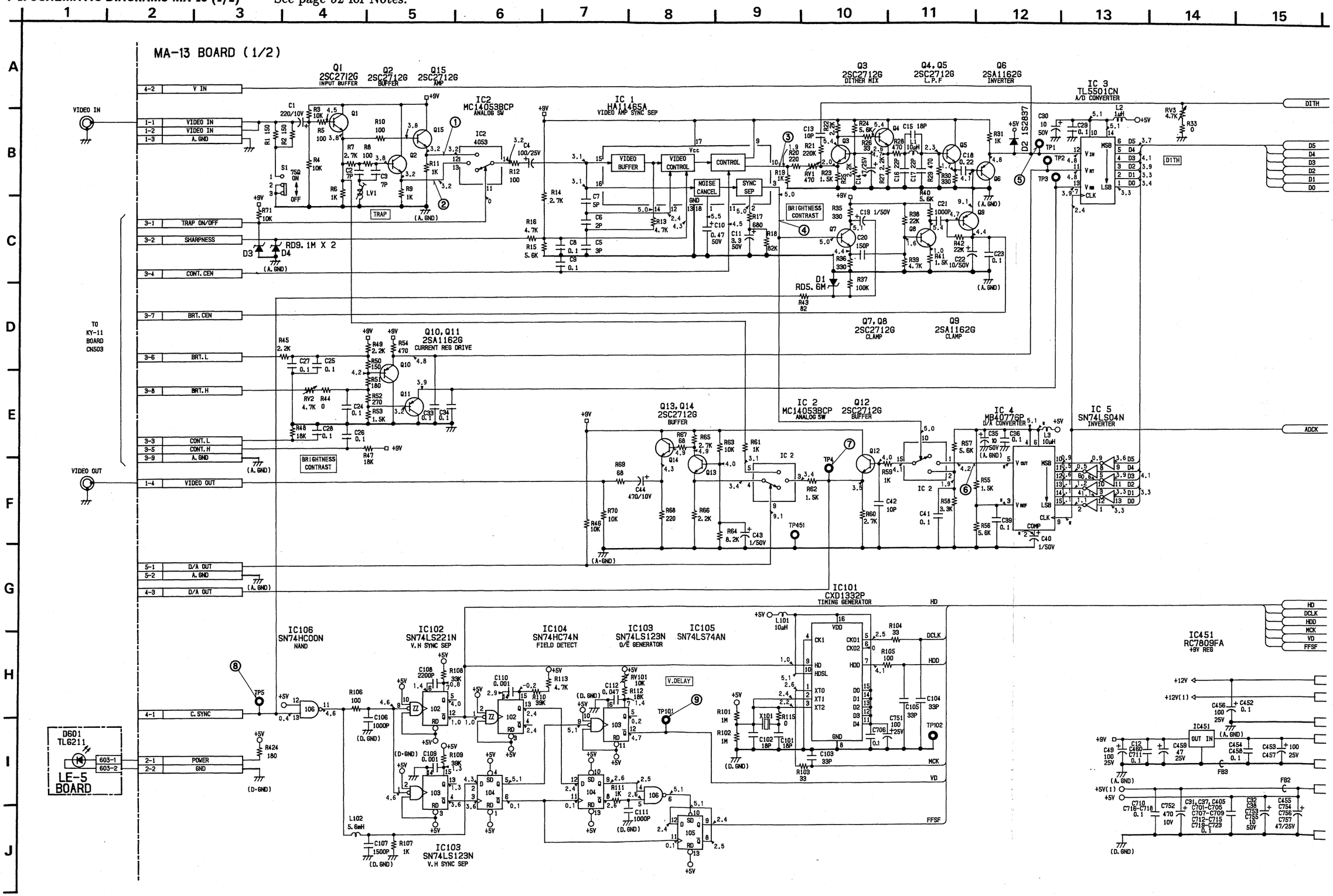
6-3. OVERALL BLOCK DIAGRAM

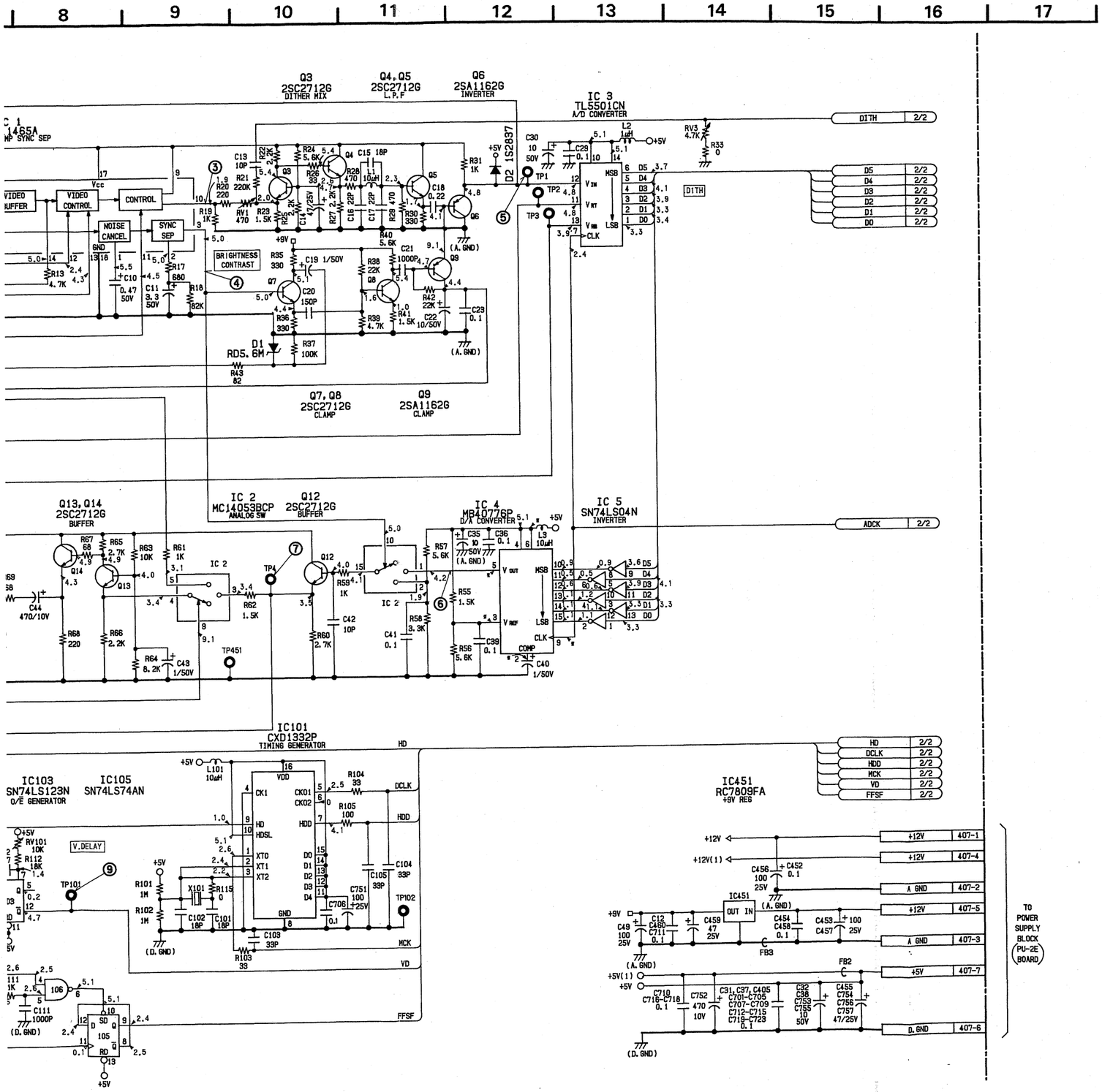


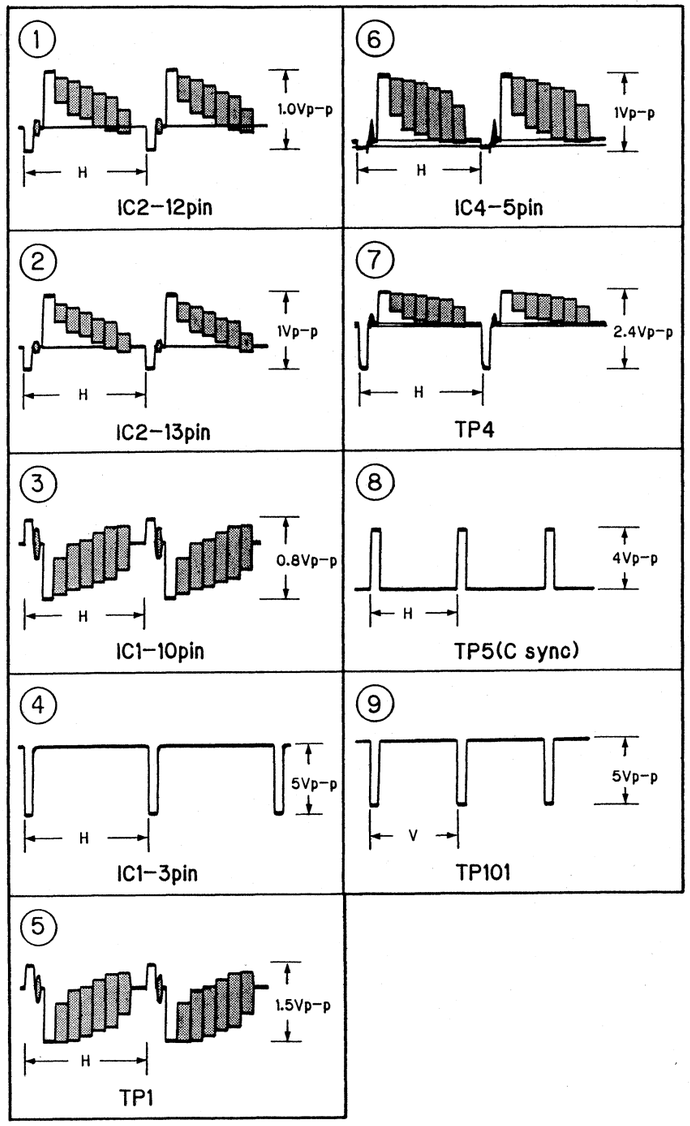
SECTION 7
PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

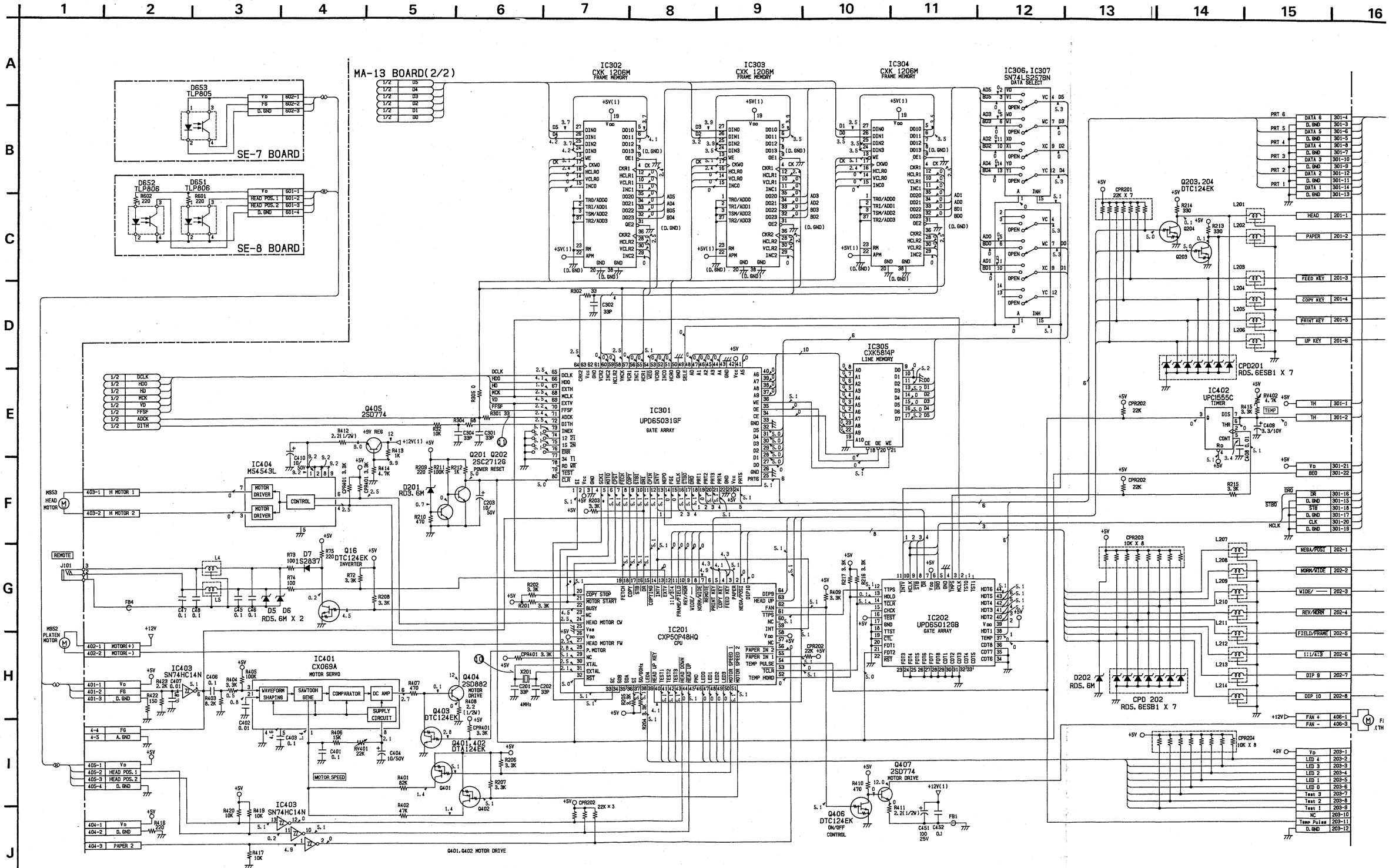
7-1. SCHEMATIC DIAGRAMS MA-13 (1/2)

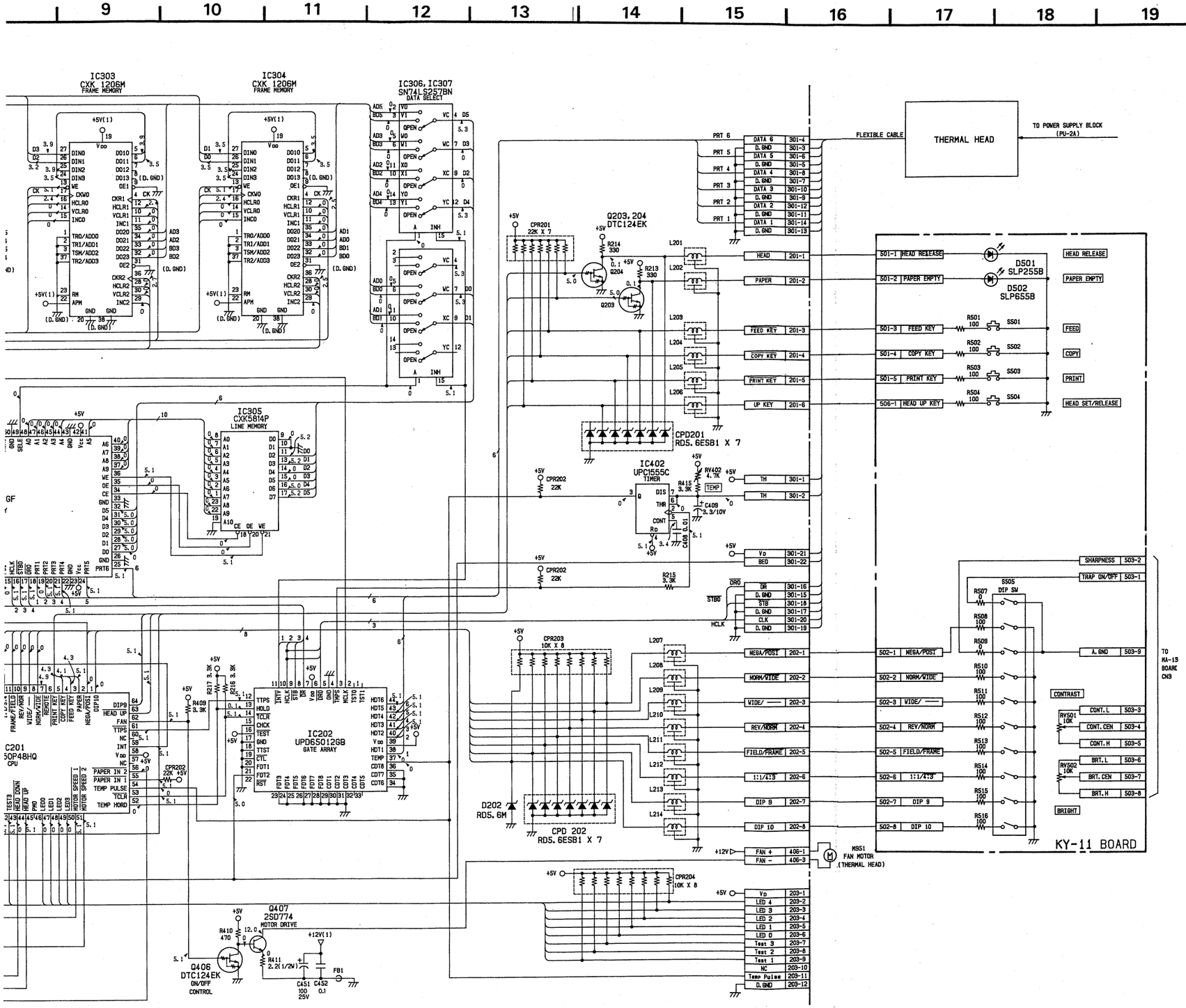
See page 52 for Notes.

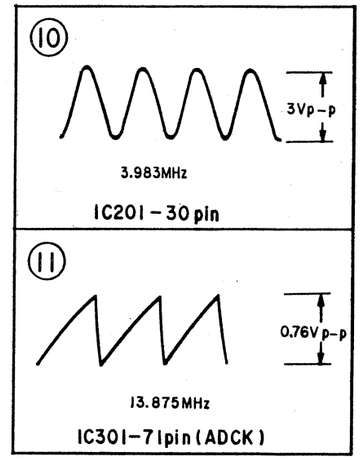



8
9
10
11
12
13
14
15
16
17
Q3
2SC2712G
DITHER MIX
Q4,Q5
2SC2712G
L.P.F
Q6
2SA1162G
INVERTER
IC 3
TL5501CN
A/D CONVERTER
DITH
2/2
D5
D4
D3
D2
D1
D0
VIDEO CONTROL
CONTROL
NOISE CANCEL
SYNC SEP
BRIGHTNESS CONTRAST
Q7,Q8
2SC2712G
CLAMP
Q9
2SA1162G
CLAMP
Q13,Q14
2SC2712G
BUFFER
IC 2
MC14053BCP
ANALOG SW
Q12
2SC2712G
BUFFER
IC 4
MB40776P
D/A CONVERTER
IC 5
SN74LS04N
INVERTER
ADCK
IC101
CXD1332P
TIMING GENERATOR
HD
DCLK
HDD
MCK
VD
FFSF
IC103
SN74LS123N
O/E GENERATOR
IC105
SN74LS74AN
V.DELAY
IC451
RC7809FA
+9V REG
+12V
+12V(1)
+9V
+5V
+5V(1)
A GND
D.GND
TO POWER SUPPLY BLOCK (PU-2E BOARD)
407-1
407-4
407-2
407-5
407-3
407-7
407-6


1
1.0Vp-p
H
IC2-12pin
6
1Vp-p
H
IC4-5pin
2
1Vp-p
H
IC2-13pin
7
2.4Vp-p
H
TP4
3
0.8Vp-p
H
IC1-10pin
8
4Vp-p
H
TP5(C sync)
4
5Vp-p
H
IC1-3pin
9
5Vp-p
V
TP101
5
1.5Vp-p
H
TP1


MA-13 BOARD(2/2)
SE-7 BOARD
SE-8 BOARD
IC302 CXK 1206M FRAME MEMORY
IC303 CXK 1206M FRAME MEMORY
IC304 CXK 1206M FRAME MEMORY
IC306, IC307 SN74LS257BN DATA SELECT
IC301 UPD650316F GATE ARRAY
IC305 CXK5814P LINE MEMORY
IC201 CXP50P48HQ CPU
IC202 UPD65012GB GATE ARRAY
IC401 CX069A MOTOR SERVO
IC402 UPC1555C TIMER
IC403 SN74HC14N
IC404 M54543L
Q405 2SD774
Q201 Q202 2SC2712G
Q16 DTC124EK
Q403 DTC124EK
Q401,402 DTA124EK
Q404 2SD882
Q407 2SD774
Q406 DTC124EK
Q203,204 DTC124EK
D201 RD5.6M
D5 D6 RD5.6M X 2
CPD201 RD5.6ESB1 X 7
CPD 202 RD5.6ESB1 X 7
Q401,Q402 MOTOR DRIVE
HEAD MOTOR
PLATEN MOTOR
REMOTE
MOTOR SPEED
SUPPLY CIRCUIT
POWER RESET
HEAD
PAPER
FEED KEY
COPY KEY
PRINT KEY
UP KEY
TEMP
FAN
LED 4
LED 3
LED 2
LED 1
LED 0
Test 3
Test 2
Test 1
Temp Pulse





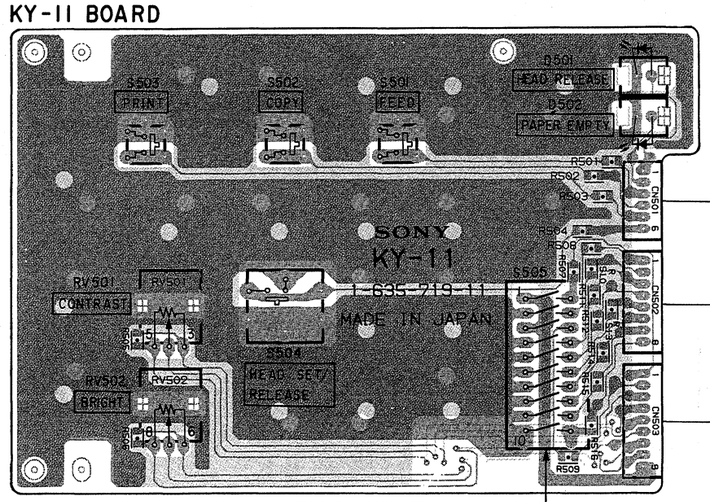
For schematic diagrams.

- All capacitors are in μF unless otherwise noted. pF : μμF 50WV or less are not indicated except for electrolytics
- All resistors are in ohms, 1/10W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.
- ▭ : panel designation.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a 10MΩ digital multimeter.
- ▭ : adjustment for repair.
- Readigns are taken with color-bar signal input.
- Voltage variations may be noted due to normal production tolerances.
- * : Impossible to measure the voltage at the marked points.

For printed wiring boards.

- ▭ : soldering side
- ▭ : component side

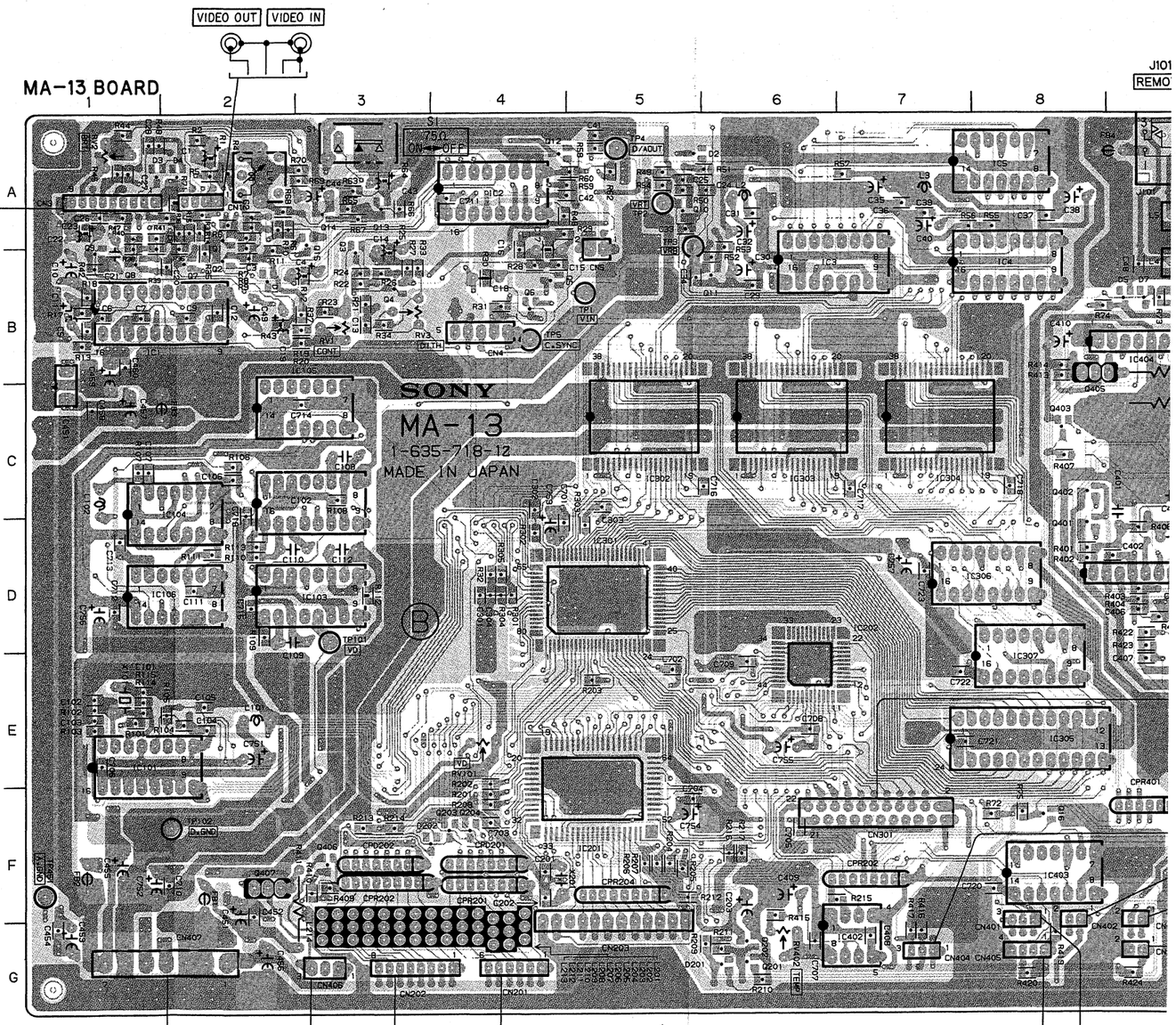
KY-II BOARD



S505

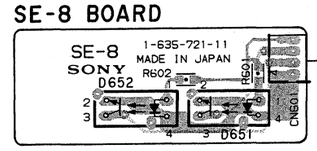
TRAP	OFF	ON
	POSI	NEGA
SHARPNESS	SOFT	SHARP
SCAN MODE	WIDE-I	NORM
	——	WIDE 2
DIRECTION	NORM	REV
MEMORY	FRAME	FIELD
ASPECT	4:3	I:1

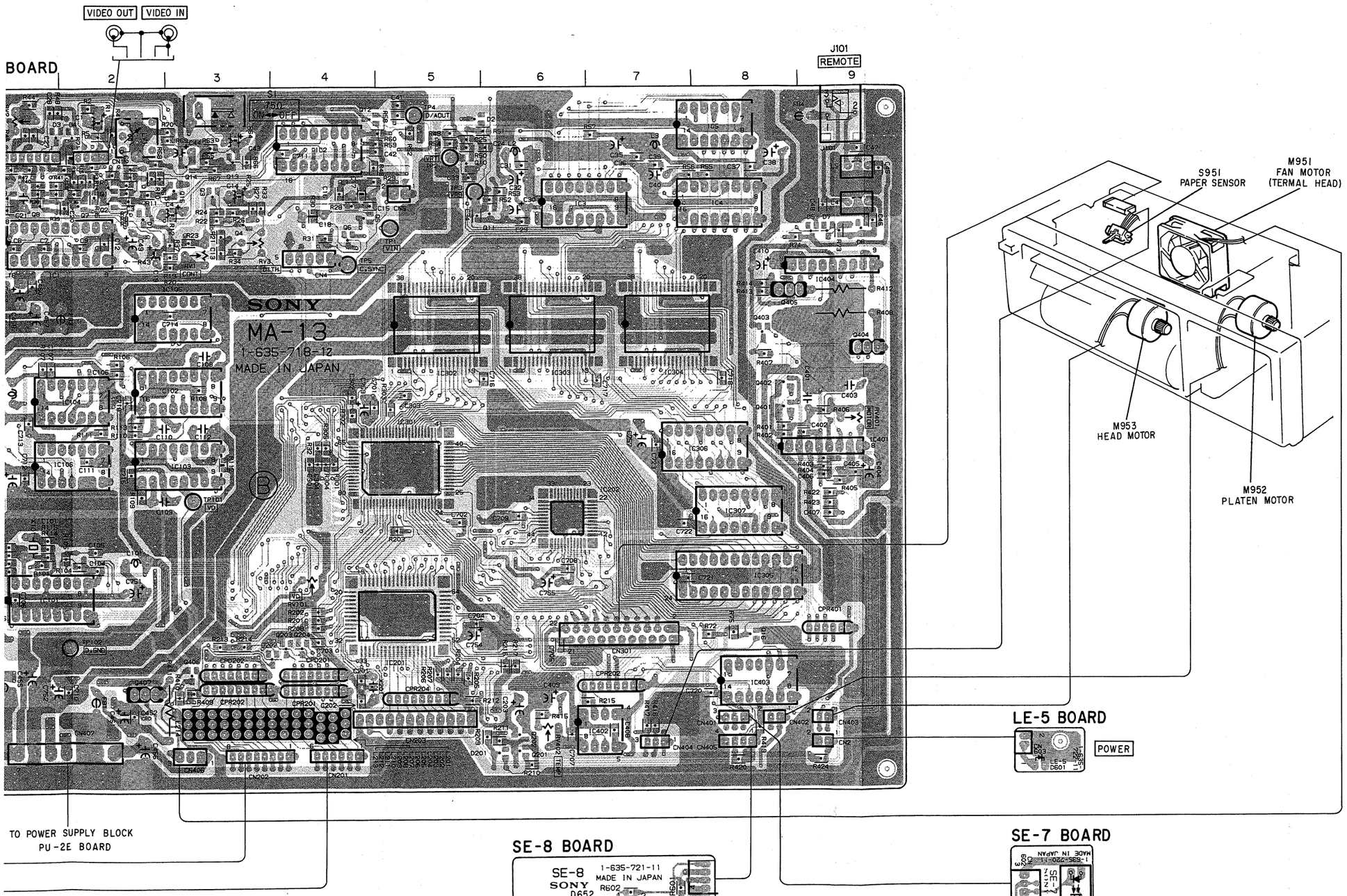
MA-13 BOARD



TO POWER SUPPLY BLOCK
PU-2E BOARD

SE-8 BOARD



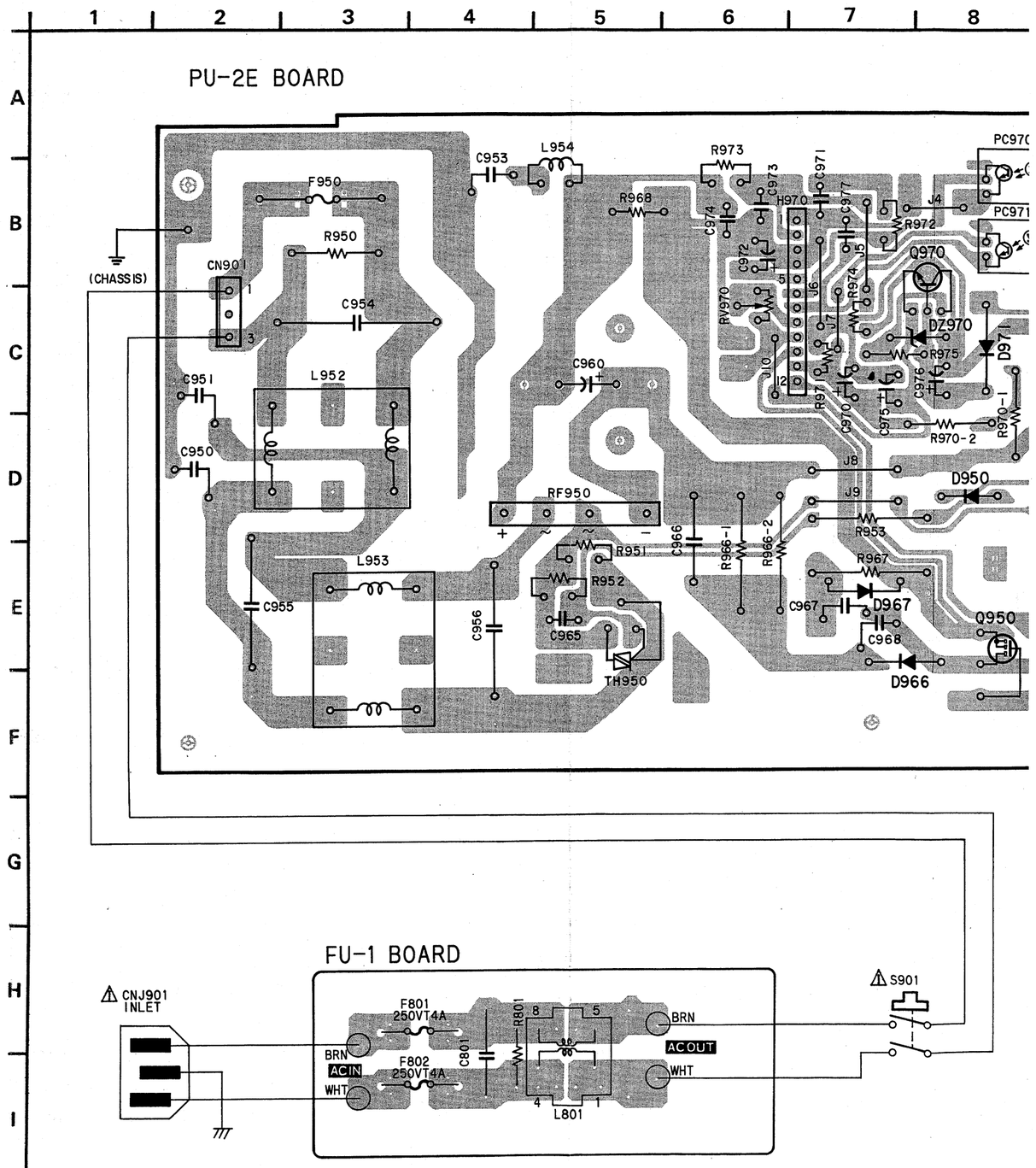


MA-13 Board

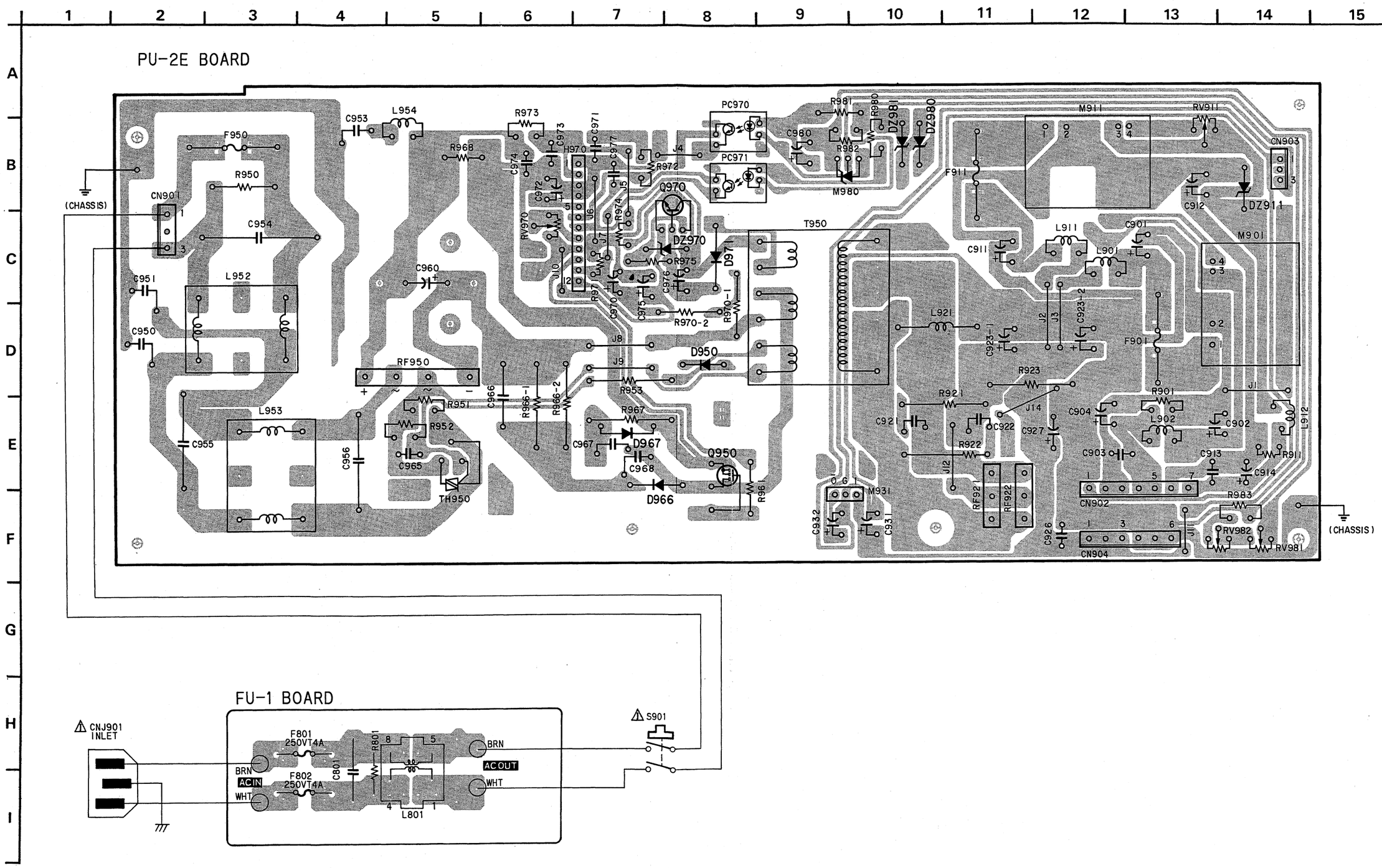
CN1	A-2	Q1	A-2
CN2	G-9	Q2	B-2
CN3	A-1	Q3	A-3
CN4	B-4	Q4	B-3
CN5	B-5	Q5	B-5
CN201	G-4	Q6	B-4
CN202	G-3	Q7	B-2
CN203	G-5	Q8	B-1
CN301	F-7	Q9	A-1
CN401	G-8	Q10	A-5
CN402	G-8	Q11	B-6
CN403	G-9	Q12	A-4
CN404	G-7	Q13	A-3
CN405	G-8	Q14	A-3
CN406	G-3	Q15	B-3
CN407	G-2	Q16	F-8
		Q201	G-6
D1	B-2	Q202	G-6
D2	A-6	Q203	F-4
D3	A-1	Q204	F-4
D4	A-2	Q205	
D5	B-9	Q401	D-8
D6	B-9	Q402	C-8
D7	B-9	Q403	C-8
D201	G-5	Q404	C-9
D202	F-3	Q405	C-8
		Q406	F-3
IC1	B-1	Q407	F-2
IC2	A-4		
IC3	B-6	RV1	B-3
IC4	B-8	RV2	A-1
IC5	A-8	RV3	B-3
IC101	E-1	RV101	E-4
IC102	C-3	RV401	D-9
IC103	D-3	RV402	G-6
IC104	C-2		
IC105	B-3	TP1	B-5
IC106	D-2	TP2	A-5
IC201	F-5	TP3	A-5
IC202	E-6	TP4	A-5
IC301	D-5	TP5	B-4
IC302	C-5	TP101	D-3
IC303	C-6	TP102	F-2
IC304	C-7	TP451	F-1
IC305	E-8		
IC306	D-8		
IC307	E-8		
IC401	D-9		
IC402	G-7		
IC403	F-8		
IC404	B-9		
IC451	C-1		
LV1	A-2		

7-4. PRINTED WIRING BOARDS SWITCHING REGULATOR

See page 52 for Notes.



 See page 52 for Notes.



 See page 52 for Notes.

PU-2E BOARD

UP-910
POWER SUPPLY BLOCK
CIRCUIT DIAGRAM

SECTION 8
CIRCUIT DESCRIPTIONS

8-1. VIDEO CIRCUIT

8-1-1. Operation

The composite video signal from the BNC connector is input to the MA-13 board via CN1-① and terminated with 75Ω by R1/R2. A slide switch (S1) determines whether the input signal is terminated or not. Then, the signal passes through an input buffer, is divided into two, and goes into an analog switch (IC2-⑫ ⑬.) The original signal is input as it is to (IC-2⑫) while the signal to (IC2-⑬) has been given a luminance signal (Y signal) from which its color subcarrier component has been removed in the Trap circuit. One of these two signals is selected by DIP switch (S505-①) on the KY-11 board and the selected signal is output from IC2-⑭) and input to IC1-⑮ ⑯. IC1 provides (1) C.SYNC signal extraction, (2) picture emphasis, and (3) contrast adjustment. The extracted C.SYNC signal is output from IC1-③. The degree of picture emphasis is switched by controlling the DC voltage to IC1-⑬ using DIP switch (S505-③). Also, the signal gain is controlled by changing the DC voltage at (IC1-⑪) using the contras control (KY-11 board, RV501) on the front panel and the signal is then output from (IC1-⑩). Then the gain is adjusted with RV1 and a dither signal is injected into the adjusted signal. This dither signal is output from (IC301-⑫) and attenuated by R34. The signal is then limited in its band by a low pass filter before sent to the clamp circuit. The clamp level at that time is adjusted by RV2 and RV502 (brightness control on the front panel) and it is then input to the analog-digital converter (IC3-⑫) to be converted into 6-bit digital data. The sampling clock for the analog-digital converter is 13.875 MHz clock output from (IC301-⑪).

The converted digital data is sent to the frame memory, while it is sent to the inverter (IC5) where its polarity is inverted. Then it is sent to a digital-analog converter (IC4) to be converted back into an analog signal which is then output from (IC4-⑤). Since this signal lacks synchronization, it is mixed with the C.Sync signal by an analog switch (IC2), output from IC2-⑮ and input into an analog switch IC2-③ for output selector. The original signal from the input buffer is input to the other input of this analog switch IC2-⑤. By shorting or opening Pin ① and ② of CN5, either of these signals is selected and its output from the output buffer is sent to CN2-④.

IC301

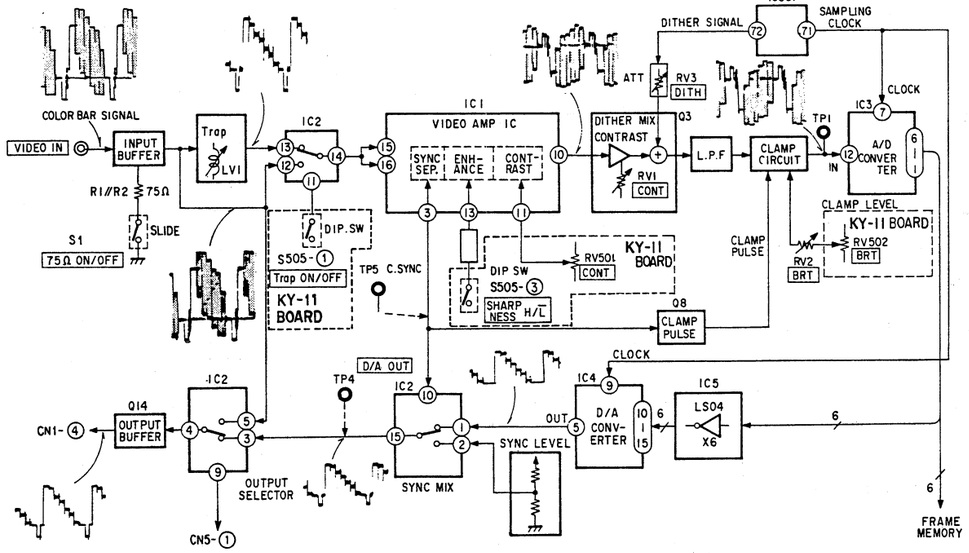


Fig. 8-1 Video Signal Processing Section Block Diagram

8-2. SYNCHRONIZATION SIGNAL PROCESSING BLOCK

The Synchronization signal processing block has the four purposes:

1. Separating horizontal sync and vertical sync signals from the composite sync signal
2. Detecting 1st and 2nd fields
3. Adjusting $\overline{VD}$
4. Providing oscillation of 13.875 MHz clock

8-2-1. Synchronization signal processing circuit

① The $\boxed{\overline{C.SYNC}}$ signal extracted from the input signal by IC1 is inverted by IC106 to become the $\boxed{\overline{C.SYNC}}$ signal (IC106 ⑪, Ⓐ in Fig. 8-2) . After the equalization pulse is extracted by IC102, the $\boxed{\overline{C.SYNC}}$ signal is input to IC106 where the $\boxed{H.H.Pulse}$ is generated again (IC102 ⑬, Ⓒ in Fig. 8-2) . (The "H" period for this $\boxed{H.H.Pulse}$ is approximately 1/2H.)

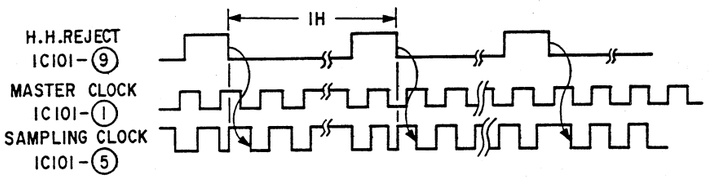
② The $\boxed{\overline{C.SYNC}}$ signal is also input to IC103, where the $\boxed{Q.H.Pulse}$ is generated (Ⓓ in Fig. 8-2) . (This $\boxed{Q.H.Pulse}$ is low for approximately 4/1H from the falling edge of $\boxed{\overline{C.SYNC.}}$) When IC104 latches C.SYNC at the rising edge of the $\boxed{Q.H.pulse}$, $\boxed{V}$ is output from IC104 ⑥ (Ⓔ in Fig. 8-2) .

③ At the rising edge of $\boxed{V}$, when the $\boxed{H.H.Pulse}$ is latched, the field is detected (Ⓕ in Fig. 8-2)), and the rising edge is output from IC106 ⑥ (Ⓗ in Fig. 8-2) . IC105 is toggled by $\boxed{V.}$ However, since the reset pulse is input to Pin ⑩ for each frame, $\boxed{1st\ FI./2nd\ FI.}$ is output from Pin ⑨ as shown by ① in Fig. 8-2.

④ $\boxed{V}$ output from IC104 ⑤ is made into $\boxed{\overline{VD}}$ by IC103 and output from Pin ⑫. $\boxed{\overline{VD}}$ is adjusted by RV101 so that its low period is 6H. (If this adjustment is improper, the 1st FI. and 2nd FI. fields are reversed in the print results.)

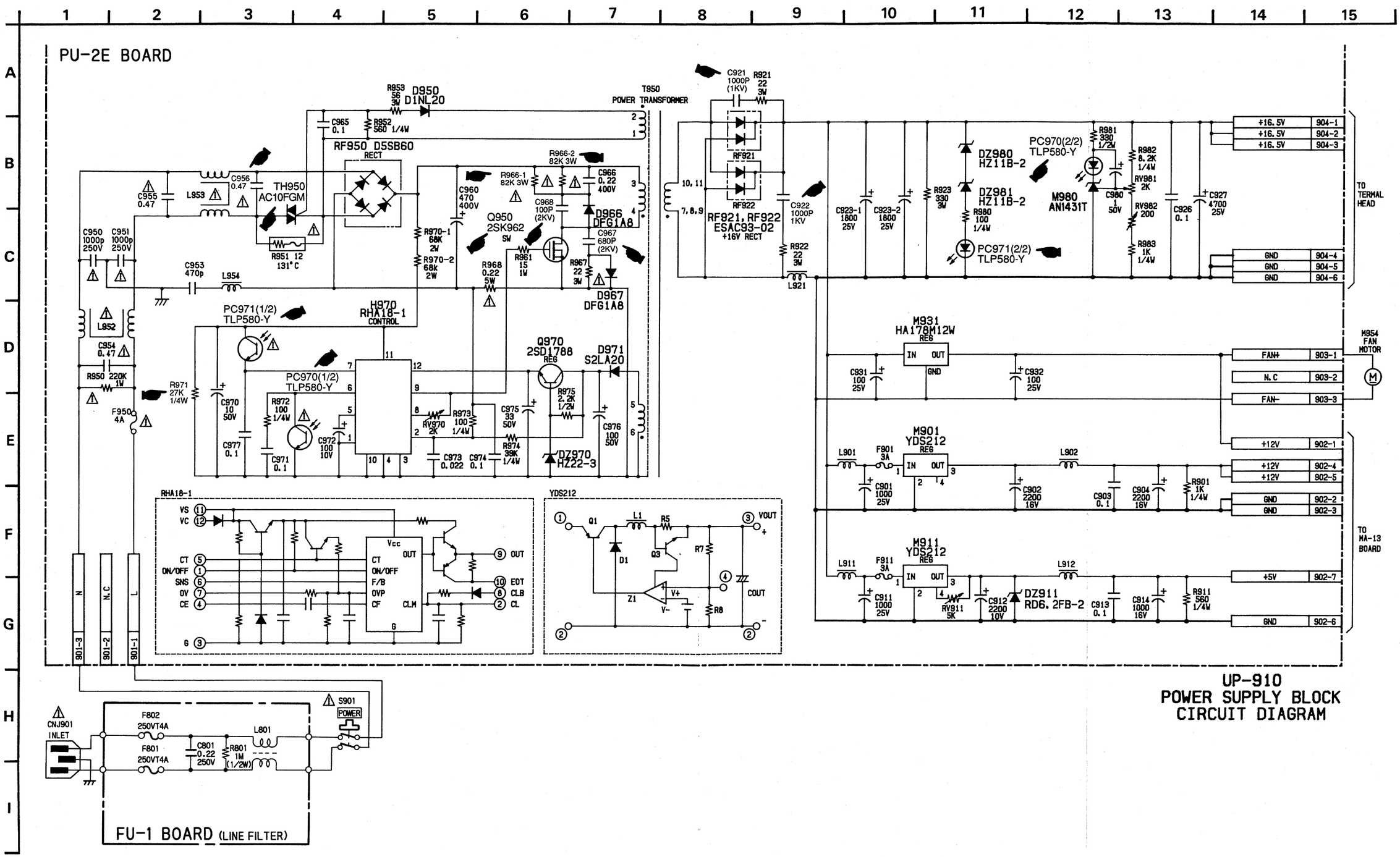
8-2-2. Oscillation circuit

An external crystal oscillator is connected to IC101 to allow the master block to be output from Pin ① and the sampling clock to be output from Pin ⑤. Both clocks are at 13.875 Hz, but the phase of the sampling clock is phase matched to the falling edge of the $\boxed{H.H.Reject}$ signal input to Pin ⑨. (See below.)



: Corrected Portions.

See page 52 for Notes.



UP-910
POWER SUPPLY BLOCK
CIRCUIT DIAGRAM

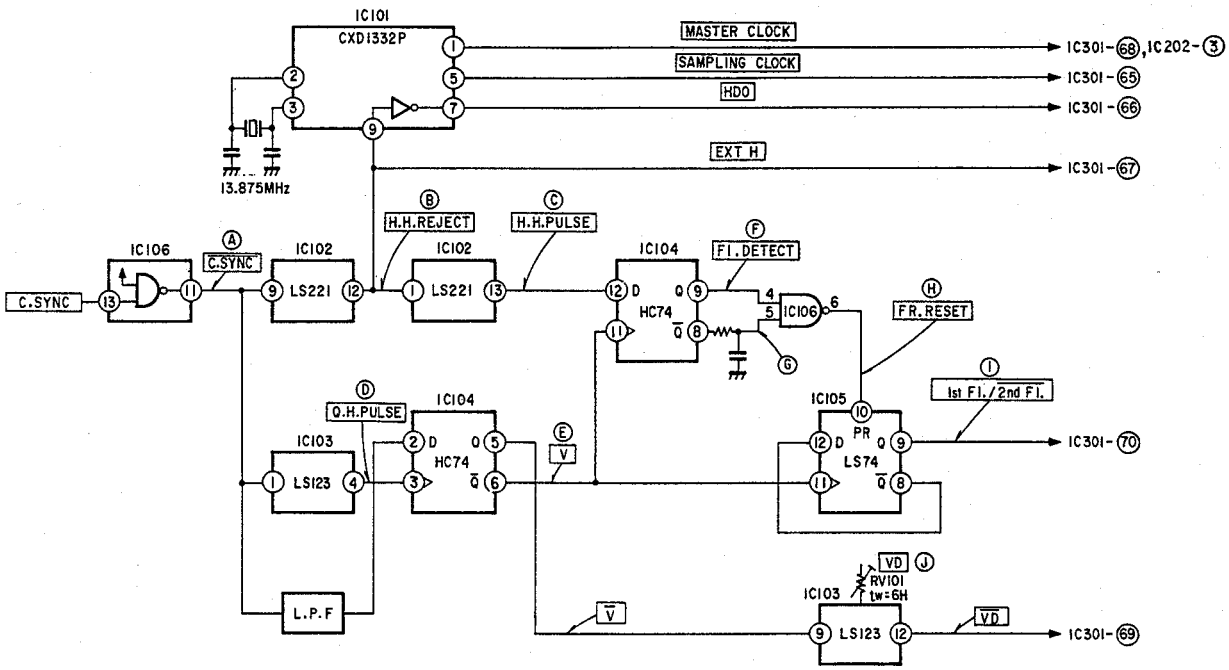


Fig. 8-2 Synchronizing Signal Processing Circuit Peripheral Block Diagram

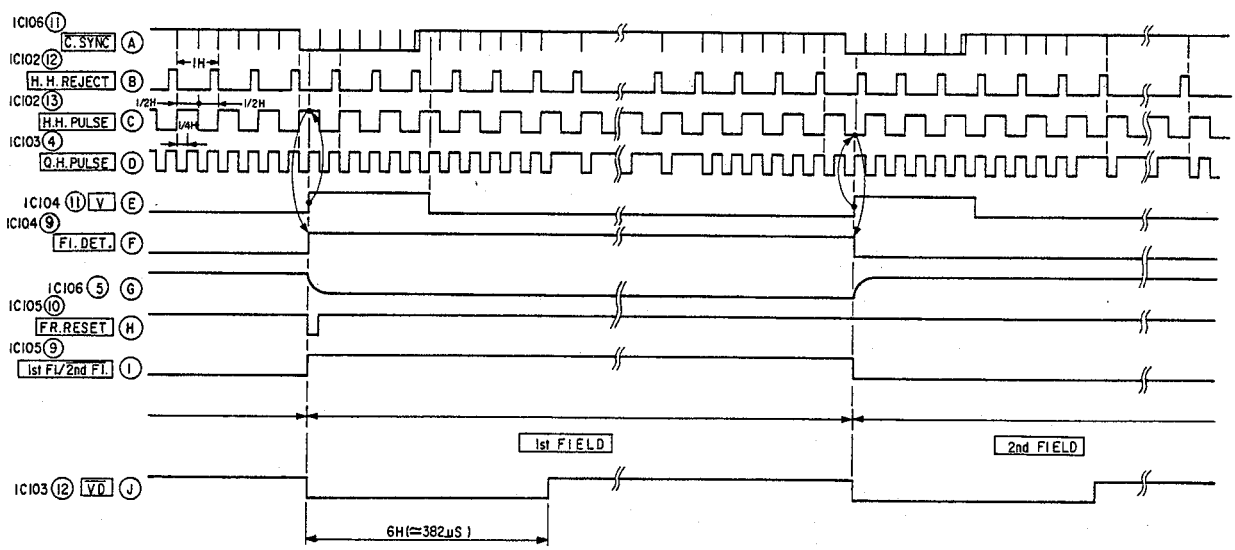


Fig. 8-3 Synchronizing Signal Processing Timing Chart

8-3. GATE ARRAY PERIPHERAL CIRCUITS

Gate array IC301 consists of the following blocks:

(1) Registers for storing serial data from the CPU (for mode setting)
(2) Frame memory write/read control
(3) Field selector control
(4) 1-line memory write/read control
(5) 1-line print timing generation
(6) Thermal head control
(7) Dither signal generation

The operation of each block is determined by the serial data from the CPU and by the mode switch terminals.

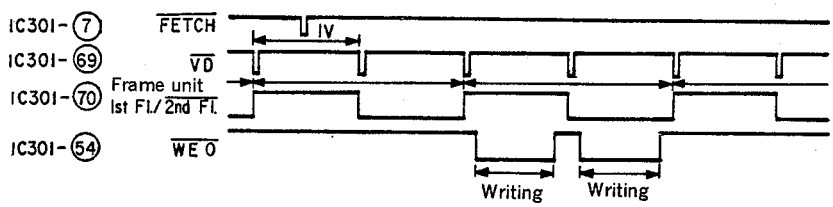
8-3-1. Operations

① Mode setting

When the CPU has judged the status of DIP switch (S505) on the KY-11 board, it sends 40 bits of serial data to a shift register in the gate array. This data sets the mode for each block in the gate array.

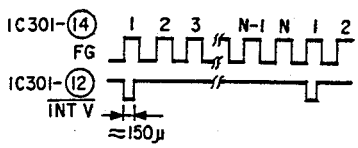
② Writing to frame memory

When the $\overline{\text{FETCH}}$ pulse from the CPU is input to IC301-⑦, the data for the next frame is written into the frame memory. IC301-㊹ $\overline{\text{WE}\phi}$ changes this way:



③ Print timing generation

The timing signal for printing one line $\overline{\text{INTV}}$ is generated by counting down the FG pulses for DC servo motor. The count down number N is determined by the serial data from the CPU. Changing this value will change the print period. Since the motor speed is fixed, this will change the print line pitch. In addition to print timing, $\overline{\text{INTV}}$ is used by the CPU to detect the CPU motor speed. The CPU judges the motor speed from $\overline{\text{INTV}}$ and it stops the motor if it detects any abnormality.



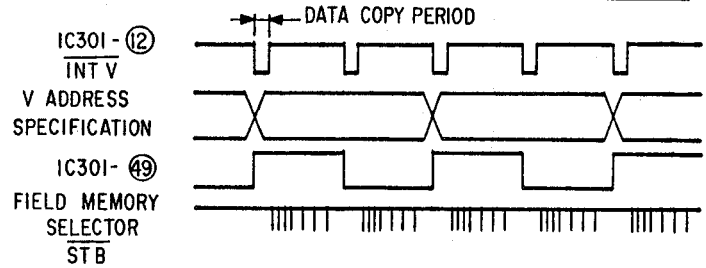
Count down number, N

Signal \ Aspect	3 : 4	1 : 1
NTSC	18	24
PAL	15	20

④ Copying from frame memory to 1line memory

When the $\overline{\text{COPY}}$ pulse is input to IC301-⑧ from the CPU, the gate array sets the $\overline{\text{COPYING}}$ (IC301-⑪) "L" and enters printing mode.

To allow printing, the 1-line of the data selected from the frame memory, must be copied to S-RAM IC305. The frame memory consists of two fields: 1st field and 2nd field. When the gate array specifies the V direction address for the frame memory, the data with the same V direction address is output from each field memory. Since the V direction address changes every print of two lines of the data, during frame printing mode, 1-line memory is copied with data by a field memory selector alternating between the two fields. The data is copied during the "L" period of each $\overline{\text{INTV}}$ pulse.



⑤ Reading out from 1-line memory

Data is read out from the 1-line memory while $\overline{\text{INTV}}$ is "H". When the $\overline{\text{STB}}$ pulse is input to IC301-⑨ from the microcomputer, the gate array begins to read data from the 1-line memory. The read-out data is then input to the gate array and compared with the tone counter. The result is converted from serial data to parallel data before it is sent to the thermal head. It is latched at the thermal head by the next $\overline{\text{STB}}$ pulse. Then, when the CPU issues the $\overline{\text{DR}}$ signal, the thermal head comes on according to the latched data. This read-out operation is repeated 64 times while $\overline{\text{INTV}}$ is high until printing of one line is completed.

⑥ End of printing

The CPU specifies the print start V address and the print end V address with serial data. The V address is incremented or decremented in DIRECT mode. When the gate array completes the specified range of printing, it returns $\overline{\text{COPYING}}$ to "H" level to tell the CPU that printing of one screen is complete.

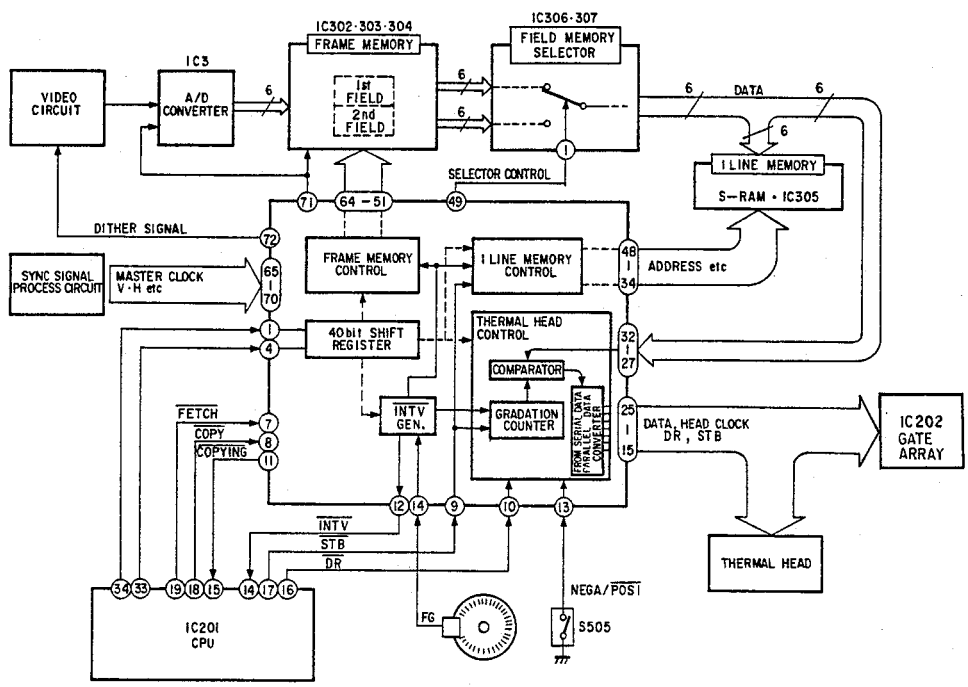


Fig. 8-4 Gate Array IC301 Peripheral Block Diagram

8-4. SYSTEM CONTROL SECTION

Setup before print

(i) Switch on the power and make sure that the POWER LED lights up.

(ii) Set paper in place and make sure that the PAPER EMPTY-LED is lit out.

(iii) Make sure that the Video signal (EIA or CCIR) is input to the VIDEO INPUT terminal.

* Note 1 : When paper is set in place, IC201 Pin ⑯ goes "L". At this time, IC201 issues the PAPER EMPTY-LED OFF signal (IC201 Pin ③)

* Note 2 : Both IC201 ㊸ and ㊹ are "L" when the head is released. At this time, IC201 issues the HEAD RELEASE-LED Display signal (IC201-⑥③).

* Note 3 : Pin ㉜ of IC201 is the reset pin. When the power is switched on, this pin is set "L" and held at the level for a few msec. Then it becomes "H" to end the reset.

8-4-1. Memory write (FETCH) signals from PRINT key

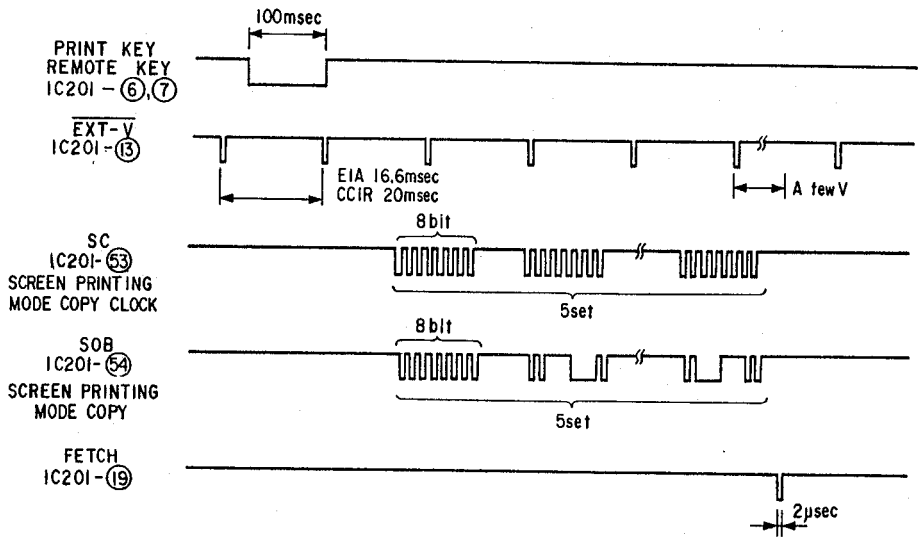


Fig. 8-5

Operation

(i) When the PRINT key or REMOTE key signal is set "L" for approximately 100 msec, the system goes into PRINT mode.

(ii) Upon entry into PRINT mode, the system first verifies $\boxed{\overline{\text{EXT-V}}}$, then it determines whether the format is EIA or CCIR.

(iii) Once the video format has been determined, the appropriate screen print mode data for that format is synchronized with the SC (serial clock) and transferred to IC301 Pin ①, the SI (serial input) terminal, from the SOB terminal (serial output B terminal). This data is five sets of 8 bits each, totally (40 data.)

(iv) A few EXT-V pulses after the data transfer is complete, the memory write timing signal (FETCH) is output. The timing is generated by IC301 and the video signal is recorded into video memory (IC302-304).

8-4-2. From memory writing until screen printing

[1] From after memory writing until temperature pulse measurement

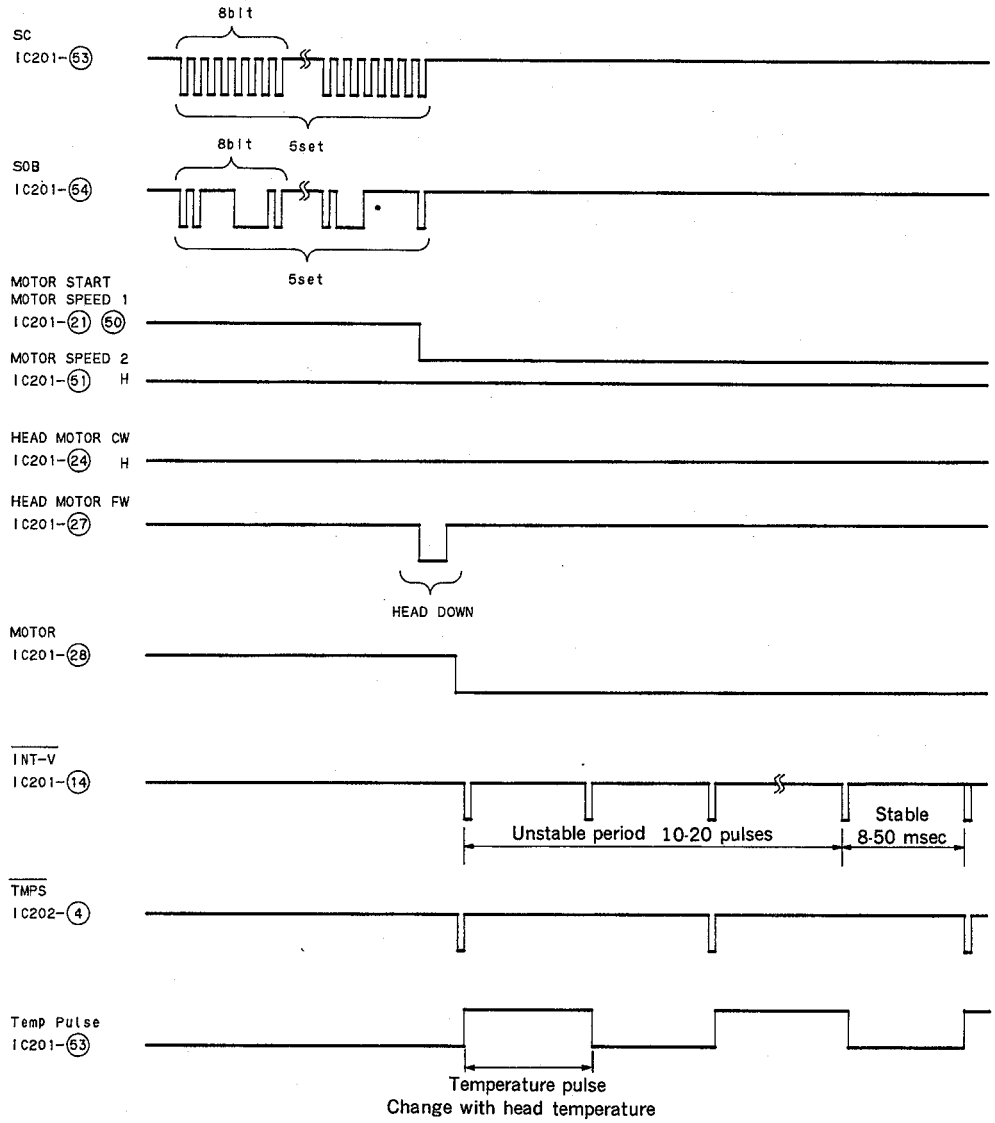


Fig. 8-6

Operation

The data input to the video memory (IC302-304) with the PRINT key operation is printed according to the following procedure.

* Note 1 : The COPY key operation is triggered by setting the COPY key "L" for at least 100msec prior to this operation.
* Note 2 : This operation may be activated only if a video signal is input to the video memory.

(i) In order to specify the output format for the data from video memory, it is synchronized at the SC terminal and the data is copied from the SOB terminal to IC301 Pin ① (SI terminal).

(ii) When the data transfer is complete, the head is moved down to the print position. The status of the terminals for the Head Motor CW, Head Motor FW and Head Position Sensor are listed below.

Head Operation	Down	Up	STOP
Head Motor CW (IC201-㉔)	H	L	H
Head Motor FW (IC201-㉗)	L	H	H

Head Position	PRINT	SET	RELEASE
Head Down (IC201-㊸)	H	L	L
Head UP (IC201-㊹)	L	H	L

(iii) After verifying that the head is moved to the print position, the system causes the motor to be turned and the $\overline{\text{INT-V}}$ to be generated via IC301-⑫ and input to IC201 Pin ⑭.
The following are the operations of the MOTOR (IC201 Pin ⑤①), MOTOR SPEED 1 (IC201 Pin ⑤⓪), MOTOR SPEED 2 (IC201 Pin ⑤②), and MOTOR START (IC201 Pin ②①) signals.
MOTOR ... Switches the motor ON/OFF.
MOTOR-SPEED 1,2 ... Switches the motor speed H/L, in 2-4 steps.
MOTOR-START ... Trigger for input of setting data into IC301's internal FG counter.
The terminal status for each mode are listed below.
*Note: Since INT-V is generated by counting down the FG pulses for motor servo, if the motor is not turning, it is not output.

(iv) When the motor is turning and the FG pulses are input to IC301 Pin ⑭, $\overline{\text{INT-V}}$ is output from IC301 Pin ⑫, and input to IC201 Pin ⑭. With in IC201, $\overline{\text{INT-V}}$ is measured for approximately 10-20 pulses to ensure that INT-V has a fixed pulse width. After verifying that the pulse period is 8-50 msec, the system proceeds to the next screen print operation.

(v) In order to measure the head temperature during Step (iii) , the Temp-Start pulse is output and the Temp pulse is input, and IC201 measures how long the Temp pulse is high.

[II] From temperature pulse measurement to screen printing

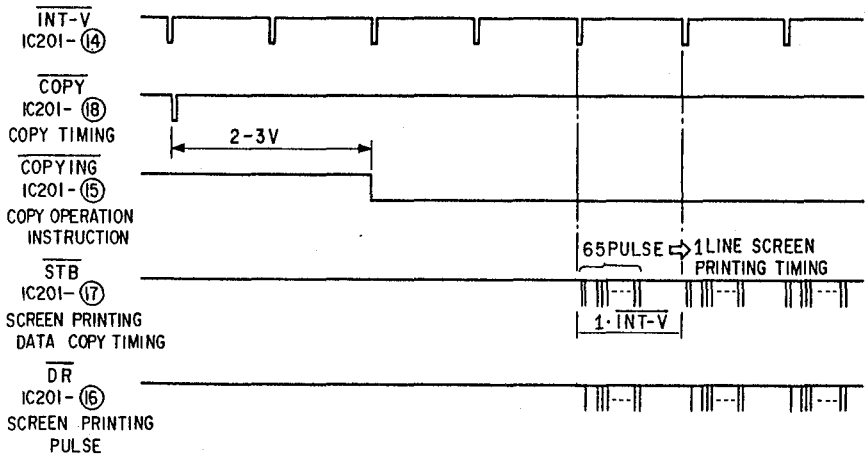


Fig. 8-7

Operations

(i) When the motor is stably rotating the $\overline{\text{INT-V}}$ period is stable, the $\overline{\text{COPY}}$ pulse is output to IC301 Pin ⑧ as synchronized with $\overline{\text{INT-V.}}$

(ii) When the $\overline{\text{COPY}}$ pulse is input to IC301 Pin ⑧, IC301 outputs the $\overline{\text{COPYING}}$ pulse from its Pin ⑪ to Pin ⑮ of IC201 to tell it that IC301 is standing by for screen printing.

(iii) When IC201 verifies that $\overline{\text{COPYING}}$ is "L", it outputs $\overline{\text{STB}}$ and $\overline{\text{DR}}$. The screen printing timing is set by these signals.
*Note: If the period of $\overline{\text{INT-V}}$ fluctuates intorelablly during screen printing, printing is stopped.

[III] To the end of screen printing and stopping

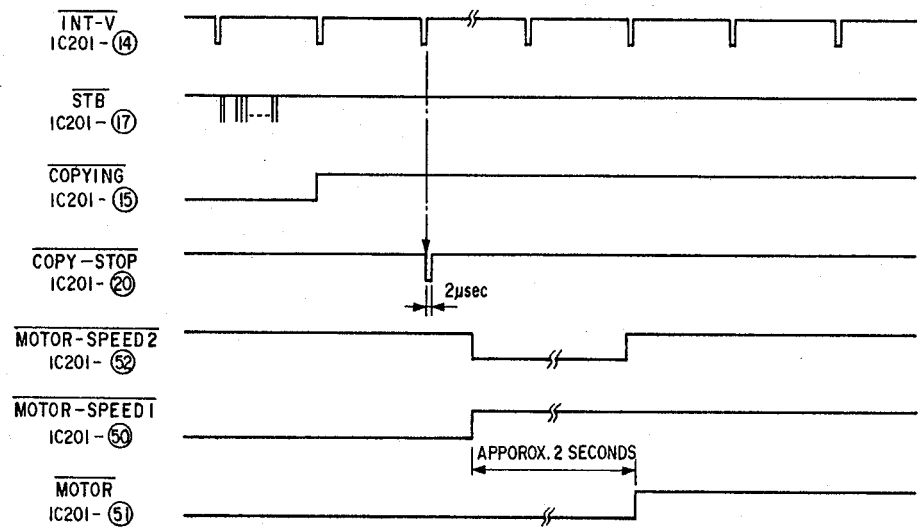


Fig. 8-8

Operations

(i) IC301 counts printed lines and when the specified number of lines have been printed, it outputs a "H" signal from its IC301 Pin ⑪ to IC201 Pin (15) of IC201, which informs IC201 of the end of printing operation. IC201 then outputs the $\overline{\text{COPY-STOP}}$ pulse.

*Note: With $\overline{\text{COPYING}}$ held "L", this $\overline{\text{COPY-STOP}}$ pulse is output if IC201 judges that some abnormal condition has occurred. In this case, when the $\overline{\text{COPY-STOP}}$ pulse is input to IC301, it sets COPYING "H".
This characteristic can be used to analyze any problem that causes printing to stop. If COPY-STOP was issued while $\overline{\text{COPYING}}$ was still "L", the cause is related to IC201. If $\overline{\text{COPY-STOP}}$ was issued after copying went high, then the cause is related to IC301.

(ii) Following the $\overline{\text{COPY-STOP}}$ pulse, the system changes $\overline{\text{MOTOR SPEED 1,2}}$ for fast forward for approximately 2 seconds, then it sets $\overline{\text{MOTOR}}$ "H" to stop the motor and complete the entire print operation.

8-4-3. Setting the mode

No. 4-8 of DIP switch S505 Pin②, ④-⑧ on the front panel are connected to IC201 to switch the screen printing mode. The mode is set when the PRINT or COPY key is pressed and the data is input serially to Pin ① of IC301 from Pin ㉞ of IC201. The mode is not allowed to be switched during screen printing.

8-5. MOTOR DRIVE (IC401) SECTION

The motor speed is controlled by IC401 (CX069A). The frequency of the FG (optical read out) of the motor section is detected and fed back to IC401, which controls the motor drive transistor Q404 to control the speed.

ON/OFF operation and speed control of the motor are made via IC201 Pin ㉛,㉚,㉘. (See explanation of the system control section.)

The printer produces the $\overline{\text{INT-V}}$ signal for screen printing timing by frequency dividing the FG frequency. This ensures that the paper feed and print quality are held constant if there is some fluctuation in the FG frequency,

8-6. THERMAL HEAD (TH47607) SECTION

The thermal head (TH47607) of the printer offers 768 dots per line (32 bits×24) and prints out screen image vertically.

8-6-1. Configuration

There are six sets of the assemblies shown below. (DATA input is present at DATA 1-6. The other terminals are common.)

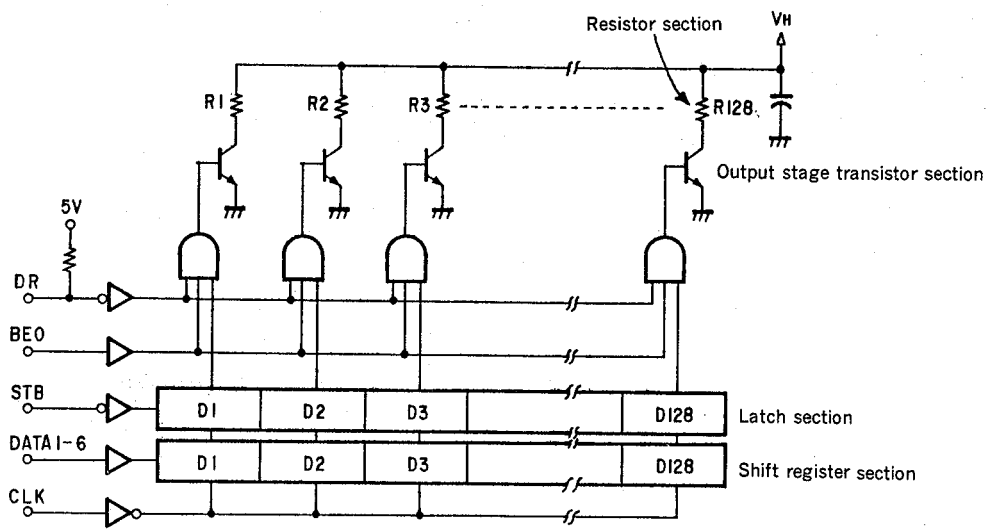


Fig. 8-9. Head Internal Circuit Configuration

8-6-2. Timing Chart

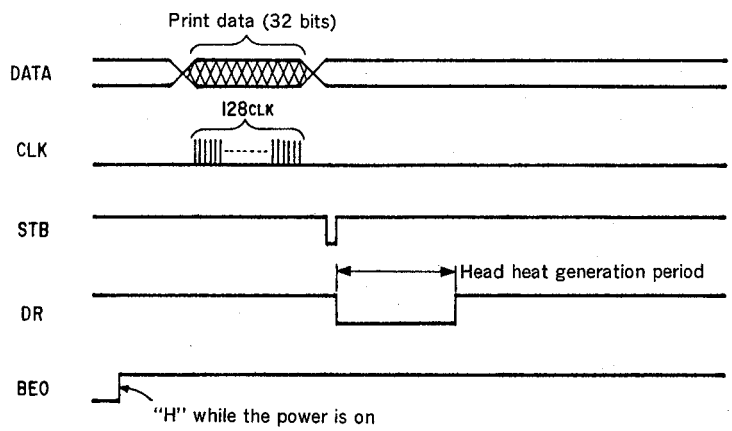


Fig. 8-10. Timing Chart

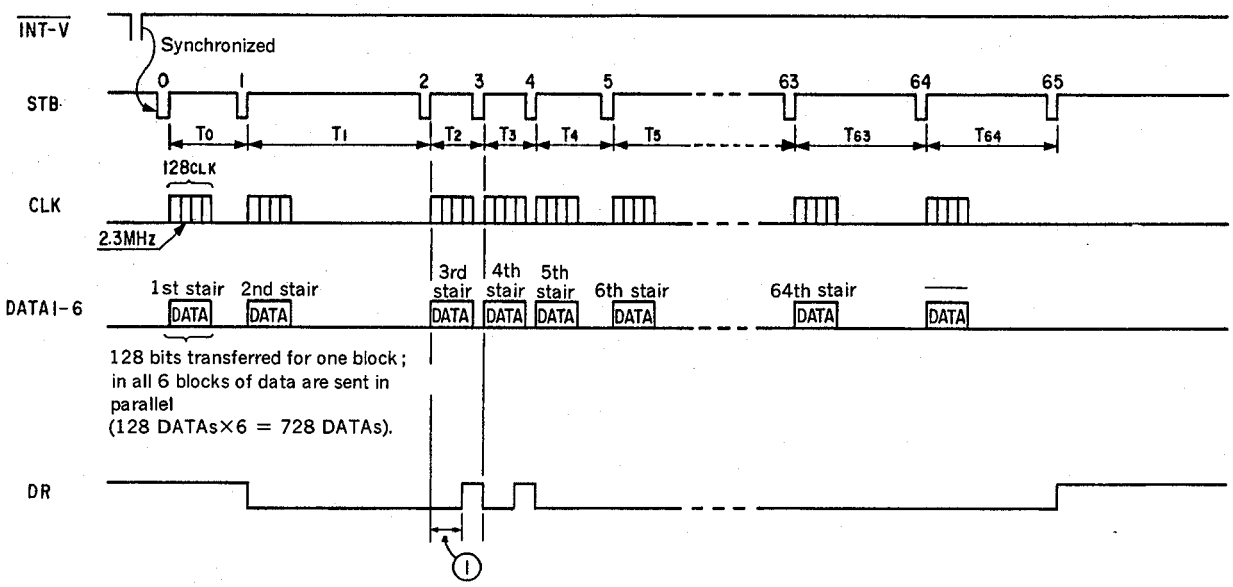


Fig. 8-11. Tone Generation

8-6-3. Basic operation

All the signals are input to the head from IC301. This section only explains the operations of one block. (Those of the other blocks are the same.)

(i) One hundred eight (128) data of screen printing are input to the shift register as synchronized with CLK.

(ii) When the STB pulse is input, the data input in Step (i) is then moved to the shift register to the latch section.

(iii) When the DR pulse is input, the output stage transistors are switched ON/OFF according to "H" and "L" pulse data of the latch section. While the transistors are on, the resistors heat up and thermosensitive paper develops color. The amount of heat generated is controlled by varying the length of the DR pulse, so that the density of the print on thermosensitive paper can be varied.

*Note: The BEO terminal changes from "L" to "H" only when the power is switched on. After that it stays "H".

8-6-4. Tone generation

As explained in Section 8-6-3 on basic operation, the density of the print can be controlled with the DR pulse. Also, it is possible to change the density by changing the high and low data input to the latch section. This section explains this method. See Fig. 8-3.

(i) Data recorded in the video memory IC302-304 in the print operation is input to IC305 by IC301 only by one H portion (one line) and then sent to IC301, the tone data generation circuit. [This tone data generation circuit outputs to IC305 with 6 bits of binary data recorded in IC305 as one of 64 levels. If this 6-bit data is "3", then the data is sent to the head during the 1st, 2nd and 3rd tones of DATA1-6 in Fig. 8-11, but from the 4th tone and after, the data is not sent. Thus, the screen image is printed until the third tone, but from the fourth tone and after, it is not printed. (See Section 8-6-3 Basic operation.)]

(ii) The data input to IC301, when the "0" STB pulse synchronized with INT-V is input, will be synchronized with CLK to cause the first tone data sent to the head shift register section.

(iii) When the "1" STB pulse is input, the 1st tone data is transferred to the latch section and the 2nd tone data is input to the shift register section. At the same time, the DR pulse goes "L" and the "H" data among the data input as the first tone data switches on the corresponding output stage transistors, heating up the corresponding resistors. The "L" data switches OFF the corresponding output stage transistors, so those resistors do not heat up.

This operation is carried out 64 times. If "H" data is sent the 1st through 64th times, the resistors generate heat the entire time and the print is the blackest possible. If the data is only high until the 32nd time, the print has an intermediate tone. This is how intermediate tones are generated by sending high data a certain number of times and generating heat in the resistors.

(iv) By controlling the time until the next data is transferred to the latch, the density having an intermediate tone can be easily controlled. Intermediate tone density can be controlled by changing the STB intervals, T_0, T_1, T_2, T_3, T_4, ..., T_{64} shown in Fig. 8-11.

Specifically, IC201 matches the intervals T1-64 to the paper's γcharacteristic (color development characteristics) as the degrees of darkening relative to the heat applied). This is called γ characteristic control.

(v) If the DR pulse is also controlled as described in 8-6-3 (Fig. 8-11), even fine tones can be expressed.

*Note: The section (1) is generated when the STB pulse T interval is 70μsec. The minimum time for the STB pulses is 70μsec.)

Thus, the printer provides smooth expression of intermediate tones by controlling the STB pulse T interval and the DR pulse.

*Note: In UP-910 is information of one line video signal to printing twice.

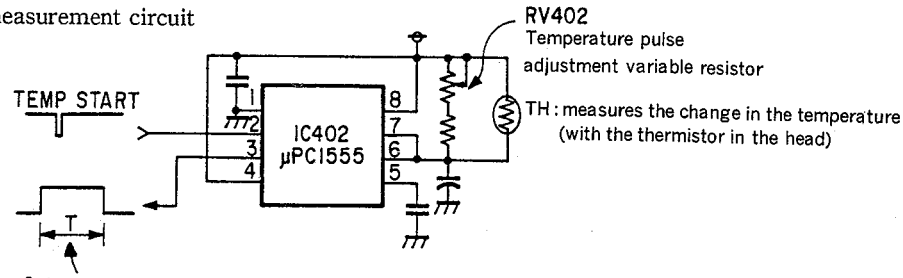
8-6-5. Temperature compensation

As explained in 8-6-4, intermediate tones are expressed by controlling the STB pulse T interval and the DR pulse. However since the energy required to make thermosensitive paper turn color varies with the ambient temperature and with the heat generated by and built up from the print head during continuous printing.

The printer has a built-in thermister (CN301-①,②). IC201 measures the change in the head temperature and compensation for temperature change is controlled by the STB pulse T interval and the D pulse, just as done for tone generation. Specifically, as the temperature rises, it reduces the STB pulse T interval and the DR pulse. As the temperature drops, it increases the STB pulse T interval and the DR pulse.

Reference

Temperature measurement circuit



Outputs a pulse whose width is inversely proportional to the temperature.

(Temperature rise → T smaller
Temperature fall → T larger)

This T width is measured within IC201 and the temperature compensation is carried out.

Fig. 8-12 Temperature Pulse Generation Circuit

8-6-6 Heat accumulation correction and Resistors number correction

The heat accumulated on the head is different between the start and the end of printing one screen. Also, the density is different in the same gray color. Heat accumulation correction is used to correct this difference in density.

The current flowing through the common resistors increases/decreases and the common drop varies according to the number of resistors energized (turned "ON") on the head. This produces differences in density for which resistors number correction is used.

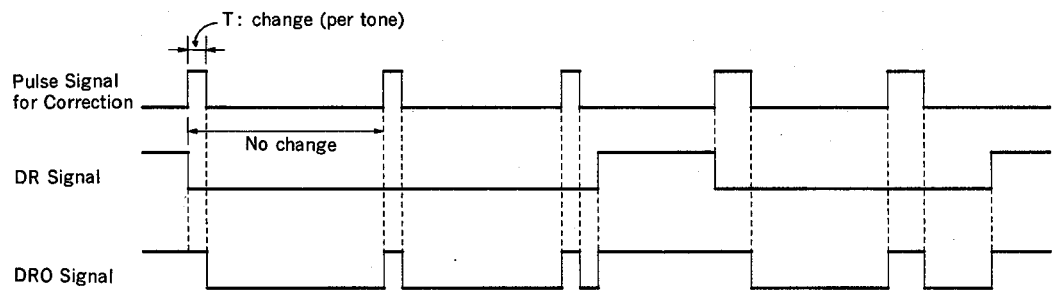
These two corrections are accomplished by IC202.

[1] Heat accumulation correction

IC202 generates the TEMP START signal (IC202-④, TMPS) from the INT-V which is used as a trigger to generate the temperature pulse (one pulse every print of two lines). IC202 measures this temperature pulse. Depending on the change, the width of the DR pulse of "0" tone is increased/decreased to correct the density difference (IC202-⑥).

[II] Resistors number correction

The DR pulse of 64 tones is used to print one line. "0" data is counted in the print data per tone (768 bits of data output from IC301-⑱,⑲,⑳,㉑,㉔,㉕) and the signal whose pulse width varies with the counted number is generated by IC202. This signal is overlapped with the DR pulse to correct the difference.



9-975-452-01

Sony Corporation

English
90JB0411-1

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VIDEO GRAPHIC PRINTER

UP-910

SERVICE MANUAL

SUPPLEMENT-1

File this supplement with the service manual.

SUBJECT

1. Correction
   Correct Section 4 Exploded Views, Section 5 Electrical Parts List and Section 7 Schematic diagram switching regulator.

UP-910 (EK)
9-975-452-81

Sony Corporation
B & I Products Group

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SECTION 4
EXPLODED VIEWS

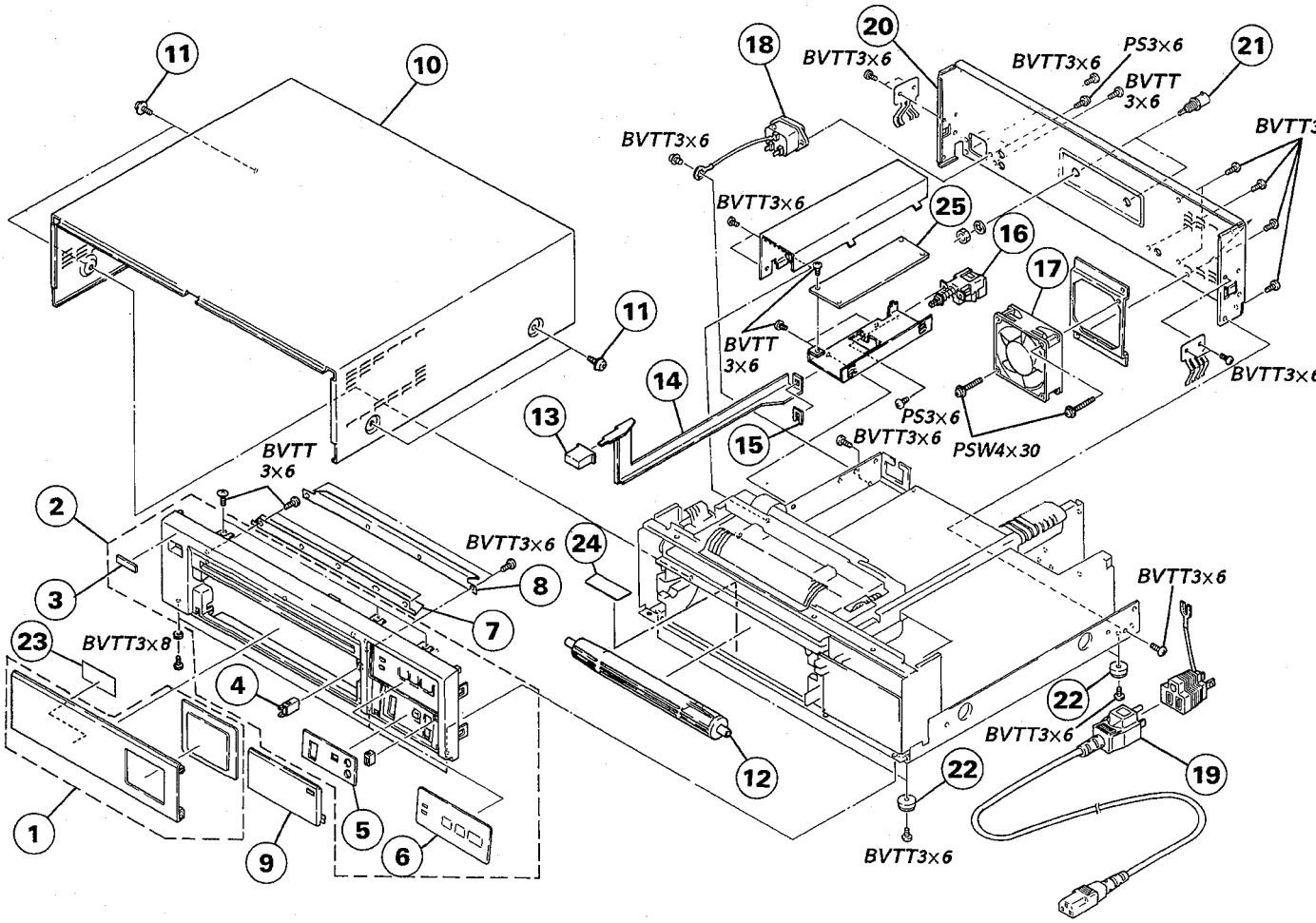
NOTE:

- Items marked " * " are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.
- The construction parts of an assembled part are indicated with a collation number in the remark column.

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

4-1. CABINET, FRONT PANEL BLOCK

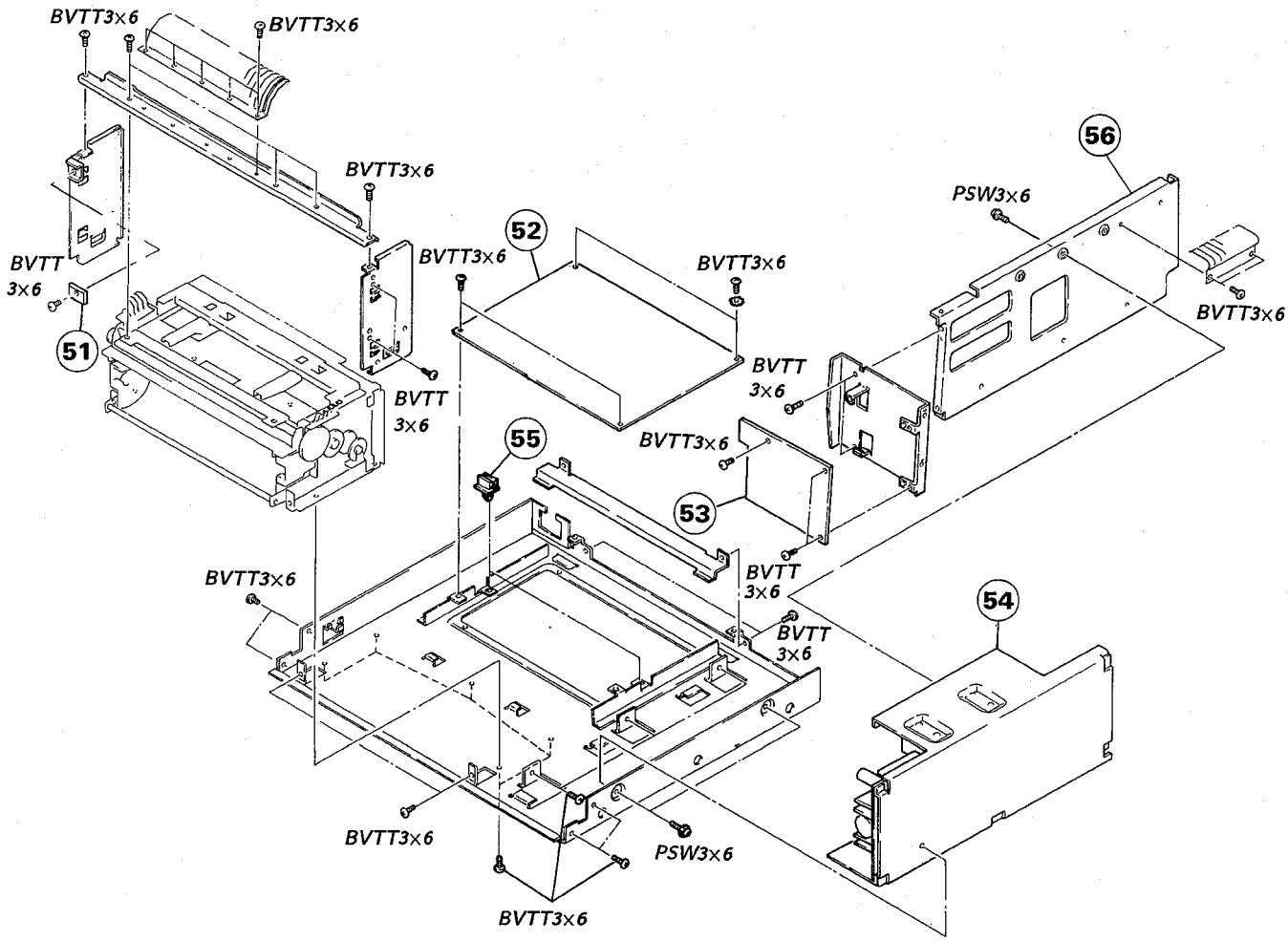
: Corrected Portions.



Ref.No.	Part No.	Description	Remark
1	X-3714-939-2	DOOR ASSY, FRONT	
2	X-3165-242-3	PANEL ASSY, FRONT	3-6
3	3-718-322-02	EMBLEM, SONY	
4	4-374-714-01	CATCH, PUSH	
5	3-745-374-01	PANEL (S), SHEET	
6	3-165-228-01	PANEL (M), SHEET	
7	*3-745-367-01	GUIDE, FRONT	
8	*3-741-017-01	GUIDE, PAPER	
9	X-3714-940-3	DOOR ASSY, KEY	
10	*3-741-049-11	COVER, TOP	
11	4-886-821-11	SCREW, M3 CASE	
12	3-741-020-01	SHAFT, PAPER	

Ref.No.	Part No.	Description	Remark
13	2-431-568-31	BUTTON, POWER	
14	*3-741-044-01	ROD, POWER SWITCH	
15	3-725-616-01	STOPPER, ROD	
16	⚠1-554-880-11	SWITCH, PUSH (AC POWER)(1 KEY)	
17	1-541-593-22	MOTOR, DC FAN	
18	⚠1-580-375-11	INLET 3P	
19	⚠1-590-910-11	CORD, POWER	
20	*3-745-375-03	PANEL, REAR ORNAMENTAL	
21	1-562-261-21	RECEPTACLE,BNC	
22	X-4875-123-1	FOOT ASSY, MF	
23	*3-734-879-01	LABEL LOADING, PAPER (E)	
24	*3-734-882-01	LABEL CAUTION, PAPER (E)	
25	*1-633-873-11	FU-1 BOARD	

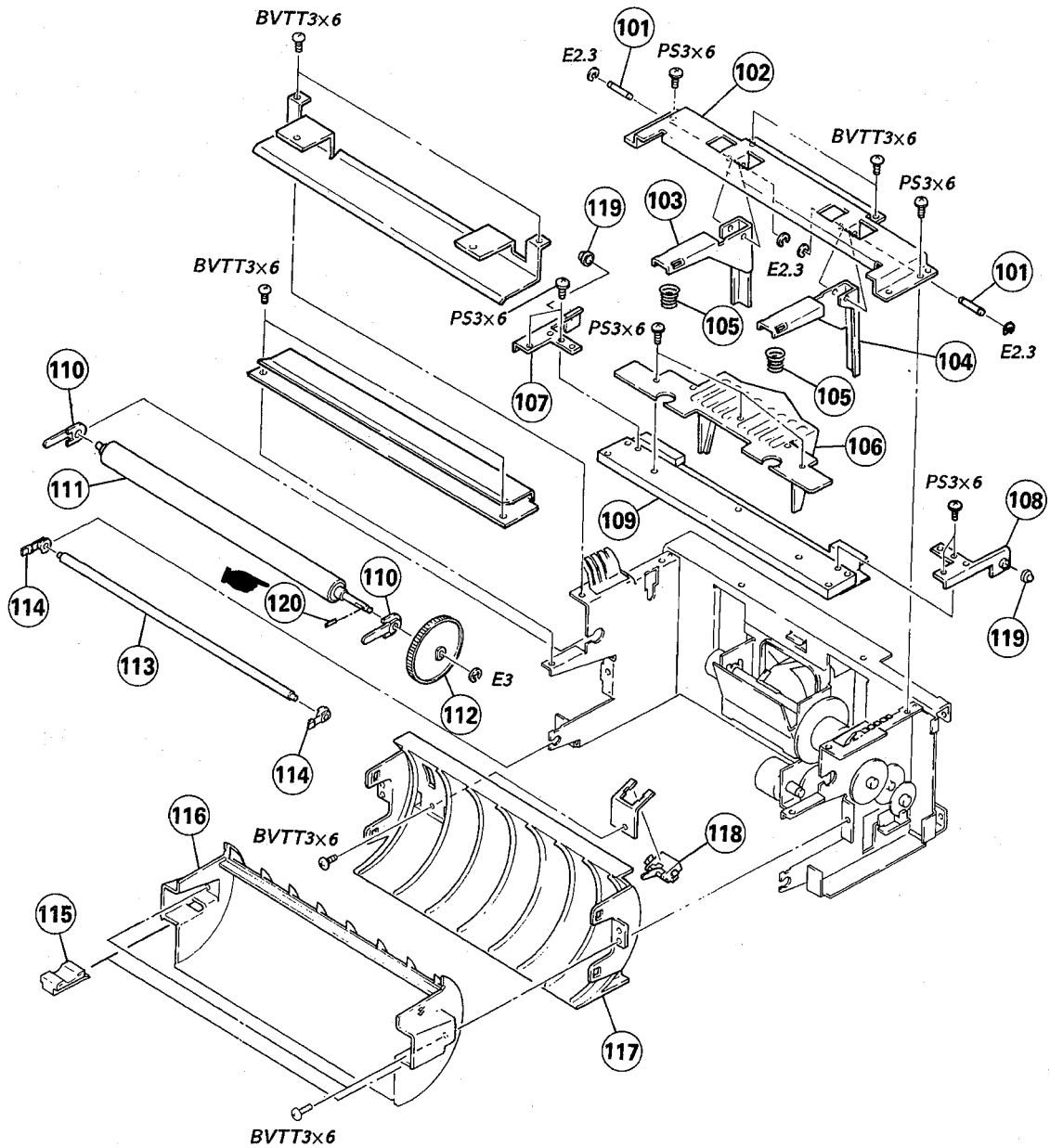
4-2. CHASSIS BLOCK : Corrected Portions.



Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety. Replace only with part number specified.

Ref.No.	Part No.	Description	Remark
51	*1-635-722-11	LE-5 BOARD	
52	*A-8271-082-A	COMPLETE PCB, MA-13	
53	*A-8276-124-A	MOUNTED PCB, KY-11	
54	⚠*1-413-547-12	REGULATOR, SWITCHING (PU-2E)	☚
55	*3-642-310-00	HOLDER BOARD	
56	*3-741-035-03	FRAME M	

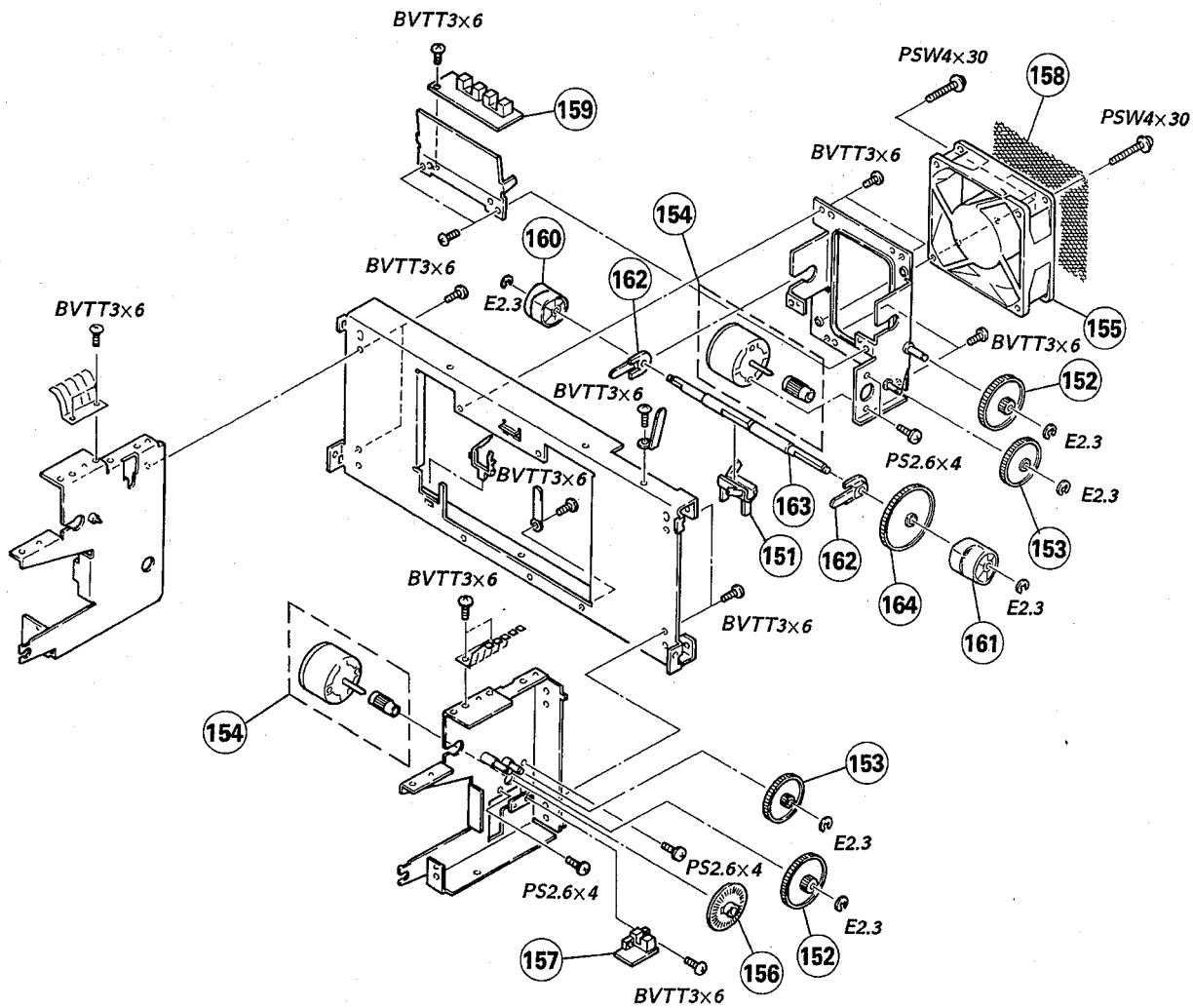
4-3. MECHANICAL BLOCK(1) ☚ : Corrected Portions.



Ref.No.	Part No.	Description	Remark
101	*3-741-007-01	SHAFT, HP	
102	*3-741-022-01	CHASSIS, TOP	
103	*3-741-006-01	PLATE (LEFT), PRESS,H	
104	*3-741-005-01	PLATE (RIGHT), PRESS, H	
105	3-741-037-02	SPRING, COMPRESSION ☚	
106	*3-741-030-01	HEAT SINK	
107	*X-3714-942-1	HOLDER (LEFT) BLOCK ASSY, H	
108	*X-3714-941-1	HOLDER (RIGHT) BLOCK ASSY, H	
109	1-543-748-12	HEAD, THERMAL (TH47607) ☚	
110	3-734-886-01	BEARING, PLATEN	

Ref.No.	Part No.	Description	Remark
111	3-741-028-05	PLATEN ☚	
112	3-734-887-03	GEAR, PLATEN ☚	
113	3-741-019-01	SHAFT, PAPER ROLLER	
114	3-741-036-01	BEARING, ROLLER	
115	3-734-894-01	BEARING, PAPER SHAFT	
116	3-741-033-02	GUIDE (A), PAPER ☚	
117	3-741-034-01	GUIDE (B), PAPER	
118	1-808-706-21	SENSOR, PHOTO (ACTUATOR)	
119	*3-741-131-02	BEARING, HH	
120	3-703-357-03	PIN, PARALLEL (DIA.7.6X6) ☚	

4-4. MECHANICAL BLOCK(2) : Corrected Portions.



Ref.No.	Part No.	Description	Remark
151	3-741-040-01	ARM, HUD SENSOR	
152	3-734-888-01	GEAR (A)	
153	3-734-889-01	GEAR (B)	
154	A-8268-073-A	MOTOR ASSY	
155	1-541-593-22	MOTOR, DC FAN	
156	3-734-891-11	FIN, FG	
157	*1-635-720-11	SE-7 BOARD	
158	*3-741-038-01	COVER, FAN	
159	*1-635-721-11	SE-8 BOARD	
160	3-741-024-01	CAM (LEFT), HEAD	

Ref.No.	Part No.	Description	Remark
161	3-741-023-01	CAM (RIGHT), HEAD	
162	3-734-886-01	BEARING, PLATEN	
163	*3-741-025-01	SHAFT, HUD	
164	3-734-887-01	GEAR, PLATEN	

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SECTION 5
ELECTRICAL PARTS LIST

NOTE:
- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- All variable and adjustable resistors have characteristic curve B, unless otherwise noted.

RESISTORS
- All resistors are in ohms
- F : nonflammable

- Items marked "＊" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.

CAPACITORS
- MF : μF, PF : μμF

COILS
- MMH : mH, UH : μH

The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

When indicating parts by reference number, please include the board name.

: Corrected Portions.

Ref.No.	Part No.	Description				Remark
	*A-8271-082-A	MA-13 BOARD COMPLETE				
		**********				
		CAPACITORS				
C1	1-126-176-11	ELECT	220MF	20%	10V	
C2	1-163-090-00	CERAMIC CHIP	7PF	0.25PF	50V	
C3	1-163-090-00	CERAMIC CHIP	7PF	0.25PF	50V	
C4	1-124-478-11	ELECT	100MF	20%	25V	
C5	1-163-086-00	CERAMIC CHIP	3PF	0.25PF	50V	
C6	1-163-085-00	CERAMIC CHIP	2PF	0.25PF	50V	
C7	1-163-088-00	CERAMIC CHIP	5PF	0.25PF	50V	
C8	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C9	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C10	1-131-345-00	TANTALUM	0.47MF	10%	35V	
C11	1-123-382-00	ELECT	3.3MF	20%	50V	
C12	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C13	1-163-093-00	CERAMIC CHIP	10PF	5%	50V	
C14	1-124-477-11	ELECT	47MF	20%	25V	
C15	1-163-099-00	CERAMIC CHIP	18PF	5%	50V	
C16	1-163-101-00	CERAMIC CHIP	22PF	5%	50V	
C17	1-163-101-00	CERAMIC CHIP	22PF	5%	50V	
C18	1-130-499-00	MYLAR	0.22MF	5%	50V	
C19	1-124-903-11	ELECT	1MF	20%	50V	
C20	1-163-121-00	CERAMIC CHIP	150PF	5%	50V	
C21	1-130-471-00	MYLAR	0.001MF	5%	50V	
C22	1-124-907-11	ELECT	10MF	20%	50V	
C23	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C24	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C25	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C26	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C27	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C28	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C29	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C30	1-124-907-11	ELECT	10MF	20%	50V	
C31	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C32	1-124-907-11	ELECT	10MF	20%	50V	
C33	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C34	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C35	1-124-907-11	ELECT	10MF	20%	50V	
C36	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C37	1-163-038-00	SERAMIC CHIP	0.1MF		25V	
C38	1-124-907-11	ELECT	10MF	20%	50V	
C39	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C40	1-124-903-11	ELECT	1MF	20%	50V	
C41	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C42	1-163-093-00	CERAMIC CHIP	10PFD	5%	50V	
C43	1-124-903-11	ELECT	1MF	20%	50V	
C44	1-124-472-11	ELECT	470MF		10V	
C45	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C46	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C47	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C48	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C49	1-124-478-11	ELECT	100MF	5%	25V	
C101	1-163-099-00	CERAMIC CHIP	18PF	5%	50V	
C102	1-163-099-00	CERAMIC CHIP	18PF	5%	50V	
C103	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C104	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C105	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C106	1-163-141-00	CERAMIC CHIP	0.001	5%	50V	
C107	1-163-145-00	CERAMIC CHIP	0.0015	5%	50V	
C108	1-130-475-00	MYLAR	0.0022	5%	50V	
C109	1-130-471-00	MYLAR	0.001MF	5%	50V	
C110	1-130-471-00	MYLAR	0.001MF	5%	50V	
C111	1-163-141-00	CERAMIC CHIP	0.001MF	5%	50V	
C112	1-130-491-00	MYLAR	0.047MF	5%	50V	
C201	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C202	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C203	1-124-907-11	ELECT	10MF	20%	50V	
C301	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C302	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C304	1-163-105-00	CERAMIC CHIP	33PF	5%	50V	
C401	1-130-495-00	MYLAR	0.1MF	5%	50V	
C402	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C403	1-130-495-00	MYLAR	0.1MF	5%	50V	
C404	1-124-907-11	ELECT	10MF		50V	
C405	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C406	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C407	1-164-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C408	1-168-232-11	CERAMIC CHIP	0.01MF	10%	50V	
C409	1-131-368-00	TANTALUM	3.3MF	10%	10V	
C410	1-124-907-11	ELECT	10MF	20%	50V	
C451	1-124-478-11	ELECT	100MF	20%	25V	
C452	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C453	1-124-478-11	ELECT	100MF	20%	25V	
C454	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C455	1-124-447-11	ELECT	47MF	20%	25V	
C456	1-124-478-11	ELECT	100MF	20%	25V	
C457	1-124-478-11	ELECT	100MF	20%	25V	
C458	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C459	1-124-447-11	ELECT	47MF	20%	25V	
C460	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C701	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C702	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C703	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C704	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C705	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C706	1-163-038-00	CERAMIC CHIP	0.1MF		25V	
C707	1-163-038-00	CERAMIC CHIP	0.1MF		25V	

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: Corrected Portions.

Ref.No.	Part No.	Description			Remark
C708	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C709	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C710	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C711	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C712	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C713	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C714	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C715	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C716	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C717	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C718	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C719	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C720	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C721	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C722	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C723	1-163-038-00	CERAMIC CHIP	0.1MF		25V
C751	1-124-478-11	ELECT	100MF	20%	25V
C752	1-124-472-11	ELECT	470MF	20%	10V
C753	1-124-907-11	ELECT	10MF	20%	50v
C754	1-124-477-11	ELECT	47MF	20%	25V
C755	1-124-907-11	ELECT	10MF	20%	50V
C756	1-124-477-11	ELECT	47MF	20%	25V
C757	1-124-477-11	ELECT	47MF	20%	25V

CONNECTOR

CN1	1-506-469-11	PIN, CONNECTOR 4P
CN2	1-506-467-11	PIN, CONNECTOR 2P
CN3	1-506-474-11	PIN, CONNECTOR 9P
CN4	*1-560-893-00	PIN, CONNECTOR 5P
CN5	*1-560-890-00	PIN, CONNECTOR 2P
CN201	*1-564-005-11	PIN, CONNECTOR 6P
CN202	*1-564-007-11	PIN, CONNECTOR 8P
CN203	*1-560-900-11	PIN, CONNECTOR 12P
CN301	1-562-966-21	SOCKET, CONNECTOR 22P
CN401	1-506-468-11	PIN, CONNECTOR 3P
CN402	1-506-467-11	PIN, CONNECTOR 2P
CN403	1-564-001-11	PIN, CONNECTOR 2P
CN404	1-564-002-11	PIN, CONNECTOR 3P
CN405	1-506-469-11	PIN, CONNECTOR 4P
CN406	*1-560-891-11	PIN, CONNECTOR 3P
CN407	*1-564-915-11	PIN, CONNECTOR 7P

HYBRID CIRCUIT

CPD201	1-233-189-11	COMPOSITION CIRCUIT BLOCK
CPD202	1-233-189-11	COMPOSITION CIRCUIT BLOCK
CPR201	1-233-165-11	COMPOSITION CIRCUIT BLOCK
CPR202	1-233-165-11	COMPOSITION CIRCUIT BLOCK
CPR203	1-232-976-11	COMPOSITION CIRCUIT BLOCK
CPR204	1-232-976-11	COMPOSITION CIRCUIT BLOCK
CPR401	1-233-164-11	COMPOSITION CIRCUIT BLOCK

Ref.No.	Part No.	Description	Remark

DIODE

D1	8-719-105-91	DIODE RD5.6M-B2
D2	8-719-801-78	DIODE 1SS184
D3	8-719-106-44	DIODE RD9.1M-B2
D4	8-719-106-44	DIODE RD9.1M-B2
D5	8-719-105-91	DIODE RD5.6M-B2
D6	8-719-105-91	DIODE RD5.6M-B2
D7	8-719-801-78	DIODE 1SS184
D201	8-719-105-52	DIODE RD3.6M-B2
D202	8-719-105-91	DIODE RD5.6M-B2

FERRITE BEAD RING

FB1	1-410-397-21	FERRITE BEAD INDUCTOR
FB2	1-410-397-21	FERRITE BEAD INDUCTOR
FB3	1-410-397-21	FERRITE BEAD INDUCTOR
FB4	1-410-397-21	FERRITE BEAD INDUCTOR

IC

IC1	8-759-304-10	IC HA11465A
IC2	8-759-140-53	IC UPD4053BC
IC3	8-759-978-95	IC TL5501CN
IC4	8-759-939-10	IC MB40776P
IC5	8-759-900-04	IC SN74LS04N
IC101	8-759-140-94	IC CXD1332P
IC102	8-759-902-21	IC SN74LS221N
IC103	8-759-901-23	IC SN74LS123N
IC104	8-759-032-81	IC MC74HC74AN
IC105	8-759-900-74	IC SN74LS74AN
IC106	8-759-916-12	IC SN74HC00AN
IC201	8-752-818-16	IC CXP5048H-250Q
IC202	8-759-504-38	IC UPD65012GB-589-3B4
IC301	8-759-145-41	IC UPD65031GF-395-3B9
IC302	8-752-340-75	IC CXK1206AM
IC303	8-752-340-75	IC CXK1206AM
IC304	8-752-340-75	IC CXK1206AM
IC305	8-752-322-06	IC CXK5814P-35
IC306	8-759-989-73	IC SN74LS257BN
IC307	8-759-989-73	IC SN74LS257BN
IC401	8-759-600-69	IC CX-069A
IC402	8-759-115-55	IC UPC1555C
IC403	8-759-916-20	IC SN74HC14AN
IC404	8-759-600-24	IC M5453L
IC451	8-759-701-59	IC NJM78M09FA

JACK

J101	1-507-967-11	JACK (REMOTE)

COIL

L1	1-410-470-11	INDUCTOR	10UH
L2	1-408-397-00	INDUCTOR	1UH
L3	1-410-470-11	INDUCTOR	10UH
L4	1-235-096-00	FILTER, LINE	
L5	1-235-096-00	FILTER, LINE	

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: Corrected Portions.

Ref.No.	Part No.	Description		Remark
L101	1-410-470-11	INDUCTOR	10UH	
L102	1-410-068-11	INDUCTOR	5.6MMH	
L201	1-236-129-11	FILTER, EMI		
L202	1-236-129-11	FILTER, EMI		
L203	1-236-129-11	FILTER, EMI		
L204	1-236-129-11	FILTER, EMI		
L205	1-236-129-11	FILTER, EMI		
L206	1-236-129-11	FILTER, EMI		
L207	1-236-129-11	FILTER, EMI		
L208	1-236-129-11	FILTER, EMI		
L209	1-236-129-11	FILTER, EMI		
L210	1-236-129-11	FILTER, EMI		
L211	1-236-129-11	FILTER, EMI		
L212	1-236-129-11	FILTER, EMI		
L213	1-236-129-11	FILTER, EMI		
L214	1-236-129-11	FILTER, EMI		

VARIABLE COIL

LV1	1-409-193-00	COIL, TRAP 3.58MHz	

TRANSISTOR

Q1	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q2	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q3	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q4	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q5	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q6	8-729-216-22	TRANSISTOR 2SA1162-G	
Q7	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q8	8-729-230-49	TRANSISTOR 2SC2712-YG	☚
Q9	8-729-216-22	TRANSISTOR 2SA1162-G	
Q10	8-729-216-22	TRANSISTOR 2SA1162-G	
Q11	8-729-216-22	TRANSISTOR 2SA1162-G	
Q12	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q13	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q14	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q15	8-729-230-49	TRANSISTOR 2SC2712-YG	
Q16	8-729-901-00	TRANSISTOR DTC124EK	
Q201	8-729-230-49	TRANSISTOR 2SC2712-YG	☚
Q202	8-729-230-49	TRANSISTOR 2SC2712-YG	☚
Q203	8-729-901-00	TRANSISTOR DTC124EK	
Q204	8-729-901-00	TRANSISTOR DTC124EK	
Q401	8-729-901-05	TRANSISTOR DTC124EK	
Q402	8-729-901-05	TRANSISTOR DTC124EK	
Q403	8-729-901-00	TRANSISTOR DTC124EK	
Q404	8-729-188-23	TRANSISTOR 2SD882-P	
Q405	8-729-140-96	TRANSISTOR 2SD774-34	
Q406	8-729-901-00	TRANSISTOR DTC124EK	
Q407	8-729-140-96	TRANSISTOR 2SD774-34	

RESISTOR

R1	1-216-029-00	METAL GLAZE	150	5%	1/10W
R2	1-216-029-00	METAL GLAZE	150	5%	1/10W
R3	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R4	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R5	1-216-025-00	METAL GLAZE	100	5%	1/10W
R6	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R7	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R8	1-216-025-00	METAL GLAZE	100	5%	1/10W
R9	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R10	1-216-025-00	METAL GLAZE	100	5%	1/10W
R11	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R12	1-216-025-00	METAL GLAZE	100	5%	1/10W
R13	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R14	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R15	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R16	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R17	1-216-045-00	METAL GLAZE	680	5%	1/10W
R18	1-216-095-00	METAL GLAZE	82K	5%	1/10W
R19	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R20	1-216-033-00	METAL GLAZE	220	5%	1/10W
R21	1-216-105-00	METAL GLAZE	220K	5%	1/10W
R22	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R23	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R24	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R25	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R26	1-216-013-00	METAL GLAZE	33	5%	1/10W
R27	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R28	1-216-041-00	METAL GLAZE	470	5%	1/10W
R29	1-216-041-00	METAL GLAZE	470	5%	1/10W
R30	1-216-037-00	METAL GLAZE	330	5%	1/10W
R31	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R32	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R33	1-216-279-00	METAL GLAZE	0	5%	1/10W
R34	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R35	1-216-037-00	METAL GLAZE	330	5%	1/10W
R36	1-216-037-00	METAL GLAZE	330	5%	1/10W
R37	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R38	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R39	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R40	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R41	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R42	1-216-081-00	METAL GLAZE	22K	5%	1/10W
R43	1-216-023-00	METAL GLAZE	82	5%	1/10W
R44	1-216-295-00	METAL GLAZE	0	5%	1/10W
R45	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R46	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R47	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R48	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R49	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R50	1-216-029-00	METAL GLAZE	150	5%	1/10W
R51	1-216-031-00	METAL GLAZE	180	5%	1/10W
R52	1-216-035-00	METAL GLAZE	270	5%	1/10W
R53	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R54	1-216-041-00	METAL GLAZE	470	5%	1/10W
R55	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R56	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R57	1-216-067-00	METAL GLAZE	5.6K	5%	1/10W
R58	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R59	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R60	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W
R61	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R62	1-216-053-00	METAL GLAZE	1.5K	5%	1/10W
R63	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R64	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W
R65	1-216-059-00	METAL GLAZE	2.7K	5%	1/10W

MA-13 SE-7 SE-8

: Corrected Portions.

Ref.No.	Part No.	Description			Remark
R66	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R67	1-216-021-00	METAL GLAZE	68	5%	1/10W
R68	1-216-033-00	METAL GLAZE	220	5%	1/10W
R69	1-216-021-00	METAL GLAZE	68	5%	1/10W
R70	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R71	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R72	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R73	1-216-025-00	METAL GLAZE	100	5%	1/10W
R74	1-216-025-00	METAL GLAZE	100	5%	1/10W
R75	1-216-033-00	METAL GLAZE	220	5%	1/10W
R101	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R102	1-216-121-00	METAL GLAZE	1M	5%	1/10W
R103	1-216-013-00	METAL GLAZE	33	5%	1/10W
R104	1-216-013-00	METAL GLAZE	33	5%	1/10W
R105	1-216-025-00	METAL GLAZE	100	5%	1/10W
R106	1-216-025-00	METAL GLAZE	100	5%	1/10W
R107	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R108	1-216-085-00	METAL GLAZE	33K	5%	1/10W
R109	1-216-689-00	METAL GLAZE	39K	5%	1/10W
R110	1-216-689-00	METAL GLAZE	39K	5%	1/10W
R111	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R112	1-216-079-00	METAL GLAZE	18K	5%	1/10W
R113	1-216-065-00	METAL GLAZE	4.7K	5%	1/10W
R115	1-216-295-00	METAL GLAZE	0	5%	1/10W
R201	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R202	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R203	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R204	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R205	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R206	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R207	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R208	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R209	1-216-033-00	METAL GLAZE	220	5%	1/10W
R210	1-216-041-00	METAL GLAZE	470	5%	1/10W
R211	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R212	1-216-049-00	METAL GLAZE	1K	5%	1/10W
R213	1-216-037-00	METAL GLAZE	330	5%	1/10W
R214	1-216-037-00	METAL GLAZE	330	5%	1/10W
R215	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R216	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R217	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R301	1-216-013-00	METAL GLAZE	33	5%	1/10W
R302	1-216-013-00	METAL GLAZE	33	5%	1/10W
R304	1-216-021-00	METAL GLAZE	68	5%	1/10W
R305	1-216-295-00	METAL GLAZE	0	5%	1/10W
R401	1-216-095-00	METAL GLAZE	82K	5%	1/10W
R402	1-216-089-91	METAL GLAZE	47K	5%	1/10W
R403	1-216-071-00	METAL GLAZE	8.2K	5%	1/10W
R404	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R405	1-216-097-00	METAL GLAZE	100K	5%	1/10W
R406	1-216-077-00	METAL GLAZE	15K	5%	1/10W
R407	1-216-041-00	METAL GLAZE	470	5%	1/10W
R408	1-249-478-00	CARBON	2.2	5%	1/2W
R409	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R410	1-216-041-00	METAL GLAZE	470	5%	1/10W

Ref.No.	Part No.	Description			Remark
R411	1-249-478-00	CARBON	2.2	5%	1/2W
R412	1-249-478-00	CARBON	2.2	5%	1/2W
R413	1-216-295-00	METAL GLAZE	0	5%	1/10W
R415	1-216-061-00	METAL GLAZE	3.3K	5%	1/10W
R416	1-216-033-00	METAL GLAZE	220	5%	1/10W
R417	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R419	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R420	1-216-073-00	METAL GLAZE	10K	5%	1/10W
R422	1-216-029-00	METAL GLAZE	150	5%	1/10W
R423	1-216-057-00	METAL GLAZE	2.2K	5%	1/10W
R424	1-216-031-00	METAL GLAZE	180	5%	1/10W

VARIABLE RESISTOR

RV1	1-228-989-00	RES, ADJ, METAL GLAZE (CONTR) 470
RV2	1-228-993-00	RES, ADJ, METAL GLAZE (BLACK LEVEL) 4.7K
RV101	1-228-994-00	RES, ADJ, METAL GLAZE (VD) 10K
RV401	1-228-995-00	RES, ADJ, METAL GLAZE (MOTOR) 22K
RV402	1-228-993-00	RES, ADJ, METAL GLAZE (TEMP) 4.7K

SWITCH

S1	1-553-725-00	SWITCH, SLIDE (75 ON/OFF)

CRYSTAL

X101	1-567-905-21	CRYSTAL, 13.875MHz
X201	1-567-192-11	CERAMIC, 4MHz

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	*1-635-720-11	SE-7 BOARD
	*1-562-736-11	HOUSING, CONNECTOR 3P
	*1-564-832-11	CONTACT, CONNECTOR
	*1-569-193-11	TERMINAL, SOLDERLESS
	*1-569-196-21	HOUSING, CONNECTOR 3P

CONNECTOR

CN602	*1-946-431-11	HARNESS (1)

DIODE

D653	8-719-800-95	DIODE TLP805

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	*1-635-721-11	SE-8 BOARD
		**********
	*1-562-737-11	HOUSING, CONNECTOR 4P
	*1-564-832-11	CONTACT, CONNECTOR
	*1-569-193-11	TERMINAL, SOLDERLESS
	*1-569-197-41	HOUSING, CONNECTOR 4P

SE-8 LE-5 KY-11 FU-1 PU-2E

: Corrected Portions.

Ref.No.	Part No.	Description	Remark
		CONNECTR	
CN601	*1-946-434-11	HARNESS (L)	
		DIODE	
D651	8-719-820-85	PHOTO INTERRUPTER TLP806	
D652	8-719-820-85	PHOTO INTERRUPTER TLP806	
		RESISTOR	
R601	1-216-033-00	METAL GLAZE 220 5% 1/10W	
R602	1-216-033-00	METAL GLAZE 220 5% 1/10W	
	*1-635-722-11	LE-5 BOARD	
	*1-564-832-11	CONTACT CONNECTOR	
	*1-569-193-11	TERIMNAL, SOLDERLESS	
	*1-569-195-41	HOUSING, CONNECTOR 2P	
		CONNECTOR	
CN603	*1-946-427-11	HARNESS (E)	
		DIODE	
D601	8-719-802-29	DIODE TLG211	
	*A-8276-124-A	KY-11 BOARD, MOUNTED	
	*1-569-193-11	TERMINAL, SOLDERLESS	
	*1-562-742-11	HOUSING, CONNECTOR 9P	
	*1-564-832-11	CONTACT, CONNECTOR	
	*1-569-199-11	HOUSING, CONNECTOR 6P	
	*1-569-201-11	HOUSING, CONNECTOR 8P	
	*1-569-202-31	HOUSING, CONNECTOR 9P	
	*1-562-739-11	HOUSING, CONNECTOR 6P	
	*1-562-741-11	HOUSING, CONNECTOR 8P	
		CONNECTOR	
CN501	*1-946-429-11	HARNESS (G)	
CN502	*1-946-430-11	HARNESS (H)	
CN503	*1-946-428-11	HARNESS (F)	
		DIODE	
D501	8-719-975-79	DIODE SLP-255B-51-A (HEAD RELEASE)	
D502	8-719-033-19	DIODE SLP-655B-51 (PAPER EMPTY)	

Ref.No.	Part No.	Description			Remark
		RESISTOR			
R501	1-216-025-00	METAL GLAZE	100	5%	1/10W
R502	1-216-025-00	METAL GLAZE	100	5%	1/10W
R503	1-216-025-00	METAL GLAZE	100	5%	1/10W
R504	1-216-025-00	METAL GLAZE	100	5%	1/10W
R507	1-216-295-00	METAL GLAZE	0	5%	1/10W
R508	1-216-025-00	METAL GLAZE	100	5%	1/10W
R509	1-216-295-00	METAL GLAZE	0	5%	1/10W
R510	1-216-025-00	METAL GLAZE	100	5%	1/10W
R511	1-216-025-00	METAL GLAZE	100	5%	1/10W
R512	1-216-025-00	METAL GLAZE	100	5%	1/10W
R513	1-216-025-00	METAL GLAZE	100	5%	1/10W
R514	1-216-025-00	METAL GLAZE	100	5%	1/10W
R515	1-216-025-00	METAL GLAZE	100	5%	1/10W
R516	1-216-025-00	METAL GLAZE	100	5%	1/10W
		VARIABLE RESISTOR			
RV501	1-241-209-11	VOLUME RK09K113 (CONTRAST) 10K			
RV502	1-241-209-11	VOLUME RK09K113 (BRIGHT) 10K			
		SWICTH			
S501	1-570-282-21	SWITCH, KEYBOARD (FEED)			
S502	1-570-282-21	SWITCH, KEYBOARD (COPY)			
S503	1-570-282-21	SWITCH, KEYBOARD (PRINT)			
S504	1-552-539-00	SWITCH, KEYBOARD (HEAD SET/RELEASE)			
S505	1-572-480-11	SWITCH, DIP			
	*1-633-873-11	FU-1 BOARD			
	*1-533-170-00	HOLDRE, FUSE			
		CAPACITOR			
C801	1-136-185-00	FILM	0.22MF	20%	205V
		FUSE			
F801	1-532-350-00	FUSE 4A 250V			
F802	1-532-350-00	FUSE 4A 250V			
		COIL			
L801	1-424-357-11	COIL, CHOKE 2.0MMH			
		RESISTOR			
R801	1-214-937-00	METAL FILM	1M	1%	1/2W

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

PU-2E

: Corrected Portions.

Ref.No.	Part No.	Description	Remark
	*1-413-547-12	REGULATOR, SWITCHING (PU-2E)	
		**********	
	*9-997-668-01	PU-2E BOARD	
	*9-996-920-01	SHEET, INSULATING	
	*9-996-921-01	SHEET, INSULATING	
	⚠ 9-996-514-01	CLIP, FUSE	

CAPACITOR

C901	9-997-657-01	ELECT	1000MF	25V
C902	1-126-589-11	ELECT	2200MF	16V
C903	1-136-165-00	FILM	0.1MF	50V
C904	1-126-589-11	ELECT	2200MF	16V
C911	9-997-657-01	ELECT	1000MF	25V
C912	9-997-658-01	ELECT	2200MF	10V
C913	1-136-165-00	FILM	0.1MF	50V
C914	1-126-588-11	ELECT	1000MF	16V
C921	9-997-659-01	CERAMIC	1000PF	1KV(DC)
C922	9-997-659-01	CERAMIC	1000PF	1KV(DC)
C923-1	9-997-660-01	ELECT	1800MF	25V
C923-2	9-997-660-01	ELECT	1800MF	25V
C926	1-136-165-00	FILM	0.1MF	50V
C927	9-997-661-01	ELECT	4700MF	25V
C931	1-126-375-11	ELECT	100MF	25V
C932	1-126-375-11	ELECT	100MF	25V
C950	⚠ 9-997-980-01	CERAMIC	1000PF	250V
C951	⚠ 9-997-980-01	CERAMIC	1000PF	250V
C953	⚠ 9-997-983-01	CERAMIC	470PF	250V
C954	⚠ 9-997-662-01	FILM	0.47MF	
C955	⚠ 9-997-662-01	FILM	0.47MF	
C956	⚠ 9-997-662-01	FILM	0.47MF	
C960	9-997-981-01	ELECT	470MF	400V
C965	1-136-165-00	FILM	0.1MF	50V
C966	1-136-201-11	FILM	0.22MF	400V
C967	1-162-116-00	CERAMIC	680PF	2KV(DC)
C968	9-997-667-01	CERAMIC	100PF	2KV(DC))
C970	1-124-667-11	ELECT	10MF	50V
C971	1-136-165-00	FILM	0.1MF	50V
C972	9-997-665-01	ELECT	100MF	10V
C973	1-130-487-00	FILM	0.022MF	50V
C974	1-136-165-00	FILM	0.1MF	50V
C975	9-997-666-01	ELECT	33MF	50V
C976	1-126-804-11	ELECT	100MF	50V
C977	1-136-165-00	FILM	0.1MF	50V
C980	1-124-903-11	ELECT	1MF	50V

CONNECTOR

CN901	⚠*1-564-104-11	CONNECTOR	
CN902	*1-564-915-11	CONNECTOR	
CN903	*1-564-007-11	CONNECTOR	
CN904	*1-564-001-41	CONNECTOR	

DIODE

D950	1-808-302-11	DIODE D1LN20
D966	8-719-510-23	DIODE DFG1A8
D967	8-719-510-23	DIODE DFG1A8
D971	8-719-510-17	DIODE S2LA20
DZ911	8-719-160-29	ZENER RD6.2FB-2
DZ970	8-719-110-60	ZENER HZ22-3
DZ980	8-719-911-12	ZENER HZ11B-2
DZ981	8-719-911-12	ZENER HZ11B-2
RF921	9-996-499-01	DIODE EASC93-02
RF922	9-996-499-01	DIODE EASC93-02
RF950	8-719-500-16	DIODE D5SB60
TH950	9-995-343-01	DIODE AC10FGM

FUSE

F901	1-576-106-11	FUSE 3A	
F911	1-576-106-11	FUSE 3A	
F950	⚠ 9-997-973-01	FUSE 4A	

COIL

L901	9-996-528-01	CHOKE COIL	
L902	9-997-632-01	CHOKE COIL	
L911	9-996-528-01	CHOKE COIL	
L912	9-997-632-01	CHOKE COIL	
L921	9-997-631-01	CHOKE COIL	
L952	⚠ 9-997-982-01	CHOKE COIL	
L953	⚠ 9-997-976-01	CHOKE COIL	
L954	9-997-975-01	FUSE INDUCTOR	

IC

H970	9-997-638-01	IC RHA18-1
M901	9-997-636-01	IC YDS212
M911	9-997-636-01	IC YDS212
M931	8-759-604-39	IC HA178M12W
M980	8-759-420-19	IC AN1431T

PHOTO COUPLER

PC970	⚠ 9-992-147-01	PHOTO COUPLER TLP580-Y
PC971	⚠ 9-992-147-01	PHOTO COUPLER TLP580-Y

TRANSISTOR

Q950	9-997-977-01	TRANSISTOR 2SK962
Q970	8-729-904-24	TRANSISTOR 2SD1788

RESISTOR

R901	1-247-513-11	CARBON	1K	1/4W
R911	1-247-507-11	CARBON	560	1/4W
R921	1-215-907-51	METAL	22	3W
R922	1-215-907-51	METAL	22	3W
R923	1-215-914-51	METAL	330	3W
R950	⚠ 9-997-642-01	METAL	220K	1W
R951	⚠ 9-996-493-01		12	
R952	1-247-507-11	CARBON	560	1/4W
R953	1-216-473-51	METAL	56	3W

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.

PU-2E

: Corrected Portions.

Ref.No.	Part No.	Description		Remark
R961	9-997-643-01	METAL	15	1W
R966-1 ⚠	9-997-978-01	METAL	82K	3W
R966-2 ⚠	9-997-978-01	METAL	82K	3W
R967 ⚠	1-215-907-51	METAL	22	3W
R968 ⚠	9-997-979-01	METAL	0.22	5W
R970-1	9-997-645-01	METAL	68K	2W
R970-2	9-997-645-01	METAL	68K	2W
R971	1-247-547-11	CARBON	27K	1/4W
R972	1-247-489-11	CARBON	100	1/4W
R973	1-247-489-11	CARBON	100	1/4W
R974	1-247-551-11	CARBON	39K	1/4W
R975	1-244-881-11	CARBON	2.2K	1/2W
R980	1-247-489-11	CARBON	100	1/4W
R981	1-244-861-11	CARBON	330	1/2W
R982	1-247-535-11	CARBON	8.2K	1/4W
R983	1-247-513-11	CRABON	1K	1/4W

VARIABLE RESISTOR

RV911	9-997-653-01	RES, ADJ 5K
RV970	9-997-654-01	RES, ADJ 2K
RV981	9-997-655-01	RES, ADJ 2K
RV982	9-997-656-01	RES, ADJ 200

TRANSFORMER

T950 ⚠	9-997-974-01	POWER

MISCELLANEOUS

	*1-590-144-11	WIRE, FLAT TYPE (22 CORE)
	*1-413-547-12	REGLATOR, SWTCHING (PU-2E)
	*1-562-211-11	HOUSING, CONNECOTR 3P
	*1-562-287-11	HOUSING, CONNECTOR 6P
	*1-562-833-11	HOUSING, CONNECTOR 6P
	*1-569-193-11	TERMINAL, SOLDERLESS
	*1-569-195-11	HOUSING, CONNECTOR 2P
	*1-569-197-11	HOUSING, CONNECTOR 4P
	*1-944-814-11	HARNESS (A)
	*1-944-815-11	HARNESS (B)
	*1-946-425-11	HARNESS (C)
	*1-946-426-11	HARNESS (D)
	*1-946-432-11	HARNESS (J)
	*1-946-433-11	HARNESS (K)
	1-543-748-12	HEAD, THERMINAL (TH47607)
	1-562-210-11	CONTACT, CONNECTOR
	1-562-261-21	RECEPTACLE, BNC
	1-569-195-11	HOUSING, CONNECTOR 2P
CN901 ⚠	1-580-375-11	INLET 3P
M951	1-541-593-22	MOTOR DC FAN
M952	A-8268-073-A	MOTOR ASSY
M953	A-8268-073-A	MOTOR ASSY
M954	1-541-593-22	MOTOR DC FAN
S901 ⚠	1-554-880-12	SWITCH, PUSH (AC POWER)(1KEY)
S951	1-808-706-21	SENSOR, PHOTO (ACTUATOR)

Ref.No.	Part No.	Description	Remark
		ACCESSORY & PACKING MATERIALS	
	1-551-475-31	CABLE ASSY	
⚠	1-590-910-11	CORD, POWER	
	3-734-869-01	SHEET, HEAD CLEANING	
	3-741-020-01	SHAFT, PAPER	
	3-751-998-13	MANUAL, INSTRUSTION	
	*3-165-230-01	INDIVIDUAL CARTON	
	*3-694-922-01	SHEET, PROTECTION	
	*3-741-052-01	CUSHION (UPPER)	
	*3-741-053-01	CUSHION (LOWER)	
	3-701-630-00	BAG, POLYETHYLENE (STANDARD)	
	3-701-623-00	BAG, POLYETHYLENE	
	3-734-880-02	LABEL LOADING, PAPER (G)	
	3-167-183-02	LABEL, E-G	

Note: The components identified by mark ⚠ or dotted line with mark ⚠ are critical for safety.
Replace only with part number specified.